

8-1968

The Conference on Historic Site Archaeology Papers 1967 - Volume 2, Part 1

Stanley South

University of South Carolina - Columbia, stansouth@sc.edu

Follow this and additional works at: https://scholarcommons.sc.edu/archanth_historic_site_arch_conf_papers



Part of the [Anthropology Commons](#)

Recommended Citation

South, Stanley, "The Conference on Historic Site Archaeology Papers 1967 - Volume 2, Part 1" (1968). *Conference on Historic Site Archaeology Papers*. 1.

https://scholarcommons.sc.edu/archanth_historic_site_arch_conf_papers/1

This Book is brought to you by the Archaeology and Anthropology, South Carolina Institute of at Scholar Commons. It has been accepted for inclusion in Conference on Historic Site Archaeology Papers by an authorized administrator of Scholar Commons. For more information, please contact dillarda@mailbox.sc.edu.

**The Conference on Historic Site
Archaeology Papers 1967**

Volume 2, Part 1

THE CONFERENCE ON HISTORIC SITE ARCHAEOLOGY PAPERS
1967

Volume 2, Part 1
September 1968

Presented at the Eighth Annual Conference

Stanley South, Editor

Additional copies of this volume (in two parts) are available
at . . . per copy from the editor.

S. C. Institute of Archaeology and Anthropology
University of South Carolina
Columbia 29208

TABLE OF CONTENTS

1. The Chairman's Report	Stanley South.	1
2. Editor's Note	Stanley South.	2
3. Early Spanish Colonial Beads	Charles H. Fairbanks . . .	3
4. Restoration Archaeology at the Paca House, Annapolis, Maryland	Stanley South.	23
5. Fort Toulouse, First Investigations, 1966	David W. Chase	33
6. The British Revolutionary Fortifications of Camden, South Carolina	Alan Calmes.	50
7. Archaeological Evidence of Pottery Repairing	Stanley South.	62
8. Machine Made Nails From a War of 1812 Site at Sackets Harbor, New York	Edward McM. Larrabee . . .	72
9. The Raising of the Mallorytown Wreck	Walter Zacharchuk. . . .	85
10. The Camden Site, Carolina County, Virginia	Howard A. MacCord, Sr. . .	95
11. A New Underwater Excavating System for the Archaeologist	Carl J. Clausen.	98
12. A Sprigg Mould for "Flowers for the Fine Pottery"	Brad Rauschenberg. . . .	107

PLATES, FIGURES, AND TABLES

<u>Author</u>	<u>Title</u>	<u>Page</u>
Fairbanks	Nueva Cadiz Plain and Nueva Cadiz Twisted (Figure 1)	17
	Florida Cut Crystal	17
	(Figure 2)	
	Diameter of Nueva Cadiz Plain Beads . .	18
	(Table 1)	
	Length of Nueva Cadiz Plain Beads . . .	18
	(Table 2)	
	Diameter of Nueva Cadiz Twisted Beads .	19
	(Table 3)	
	Length of Nueva Cadiz Twisted Beads . .	19
	(Table 4)	
South	Restoration Study at the Paca House, Annapolis, Maryland (Plate)	22
	Plan of the Excavations at the Paca House (Figure)	32-A
Chase	Fort Toulouse Project	44
	(Figure 1)	
Calmes	1781 Plan of Camden	54
	(Plate 1)	
	Excavation of the Powder Magazine . . .	54
	(Plate 2)	
	Excavated Evidence of the Camden Powder-Magazine, Camden, South Carolina. . . .	56
	(Figure 1)	
	1781 Plan of Camden Superimposed on a Modern Street Map of Camden, South Carolina (Figure 2)	58
South	Repaired Ceramics from Eighteenth-Century Sites (Plate)	68
Larrabee	Type Specimen Nails from Fort Kentucky, Sackets Harbor, New York (Figure) . . .	84
Zacharchuk	Raising and Landing the Brown's Bay Ship	89
	Raising of the Mallorytown Wreck . . .	92
	(Plates 1-3)	
MacCord	The Camden Site Medal	97
	(Plate)	
Clausen	Underwater Excavating Systems	102
	(Plates 1-4)	
	Conjectural Drawing of an Underwater Excavating Unit of the Future	104
	(Plate 5)	
Rauschenberg	Sprigg Mould and Sherds from the First House Excavation in Old Salem, North Carolina (Plates A-F)	115

SPECIAL ANNOUNCEMENT

Since The Conference on Historic Site Archaeology is a non-organization devoted to the publication of papers on historical archaeology it has none of the self-perpetuating advantages of a formally organized group. Because of this the chairman has asked Vincent P. Foley, Professor of Anthropology at Moravian College and Executive Director of Historic Bethlehem, Inc. to act as co-chairman of the Conference to insure its continued function of presentation and publication of papers on historical archaeology.

THE CHAIRMAN'S REPORT

The papers presented here were delivered at the eighth annual Conference on Historic Site Archaeology held in Macon, Georgia on November 9, 1967. Because of the addition of the HISTORICAL ARCHAEOLOGY FORUM section it was necessary to issue the volume in two parts, thus increasing the cost considerably over that of last year. The two hundred copies of Volume 1 were sold out before the year was over, indicating the demand for information on historical archaeology. Because of this interest the number of copies of Volume 2 has been increased to 300. The 315 pages in Volume 2 is considerably over twice the size of Volume 1, also increasing the publication cost. As a result, the total cost of Volume 2 is \$682.46, and of this amount \$447.46 has been paid from the Conference budget derived from 116 members and the sale of copies of Volume 1, leaving an unpaid balance of \$235. After the distribution of the 116 copies to the 1968 members there will remain 184 copies of Volume 2 to be sold at \$6 per copy, making an eventual income of \$1,104 from which the unpaid balance can be paid and some surplus realized for future publication of Conference papers. Judging from the demand for Volume 1 it should not take long to realize this amount from the sale of Volume 2.

With the membership in the Conference remaining around one hundred, and the publication of the papers approaching \$700 annually, it becomes clear that the three dollar membership dues will no longer support the cost of publication of the Conference papers. Therefore, the chairman is recommending that the membership dues be increased to five dollars annually for 1969. This amount, along with the sale of copies of the Conference papers, should allow the continued publication of the papers, including the HISTORICAL ARCHAEOLOGY FORUM section.

In order to keep publication cost to a minimum some of the contributors to this volume contributed their own plates. Carl Clausen supplied the half-tone plate for his paper, and Contract Archaeology, Inc. supplied the Paca House drawing, and the North Carolina Department of Archives and History has contributed the half-tone plates for South's papers.

The North Carolina Department of Archives and History has contributed considerably to the publication of this volume, both in the chairman's time and in assistance from members of the office staff. Particular thanks are due to Miss Freda Corbett and her staff who helped with stencil cutting, collating, etc., and to Garry Stone who assisted with the layout work on the plates.

Thanks are extended from the Conference chairman to those participating in the HISTORICAL ARCHAEOLOGY FORUM section of this volume. Without the cooperation of these Conference members the Forum would not have been possible.

Editor's Note

A new section has been added to The Conference on Historic Site Archaeology Papers 1967 entitled HISTORICAL ARCHAEOLOGY FORUM, in which a key paper presented at the conference is selected as a pivot around which various conference members focus their own ideas on the subject. The plan at present is to continue this forum as a section of the annual conference volume, utilizing a paper on theory, technique, method, artifacts, etc., and in so doing provide a broader range of ideas than those emerging from the conference papers alone. In Part 2 of Volume 2, Clyde Dollar's conference paper becomes a hub for this first HISTORICAL ARCHAEOLOGY FORUM.

In this Part 1 of Volume 2, the papers presented at Macon, Georgia on November 9, 1967 are included, with the exception of Clyde's. Members who have paid their \$3.00 conference dues will receive both Part 1 and Part 2. Additional copies of this volume are available at \$6.00 from the conference chairman.

Stanley South, Chairman
The Conference on Historic Site Archaeology
Box 1881
Raleigh, North Carolina

EARLY SPANISH COLONIAL BEADS *

Charles H. Fairbanks
Dept. of Anthropology
University of Florida

Abstract

Nueva Cadiz Plain and Nueva Cadiz Twisted date from the 16th century and the beginning of the 17th century. Both are square in cross-section and seem to form a distinctive class of beads. Florida Cut Crystal, dating from the 16th and early 17th centuries, are elaborately faceted and sculptured quartz crystal beads. All three types have distinctive early occurrences in Florida. They probably served as presents during the period of exploration rather than as regular trade materials.

*

This paper is based in large part on the extensive work on colonial Spanish beads of the late John M. Goggin. His manuscript on beads, unfinished at his death, is being prepared for publication by the present author. Since the death in 1963 of Dr. Goggin certain additional information on the distribution and dating of the beads has come to light. Some new speculations concerning method of manufacture has been developed. In view of the value of these beads as dating devices it was decided to publish descriptions here as the publication of his major paper may be delayed for some time.

Nueva Cadiz Plain

These are large, long, finely-made beads of a distinctive square cross-section. In Beck's shape classification they fall within his designation IX.D.2b. Typically they are much larger than most modern beads, especially in length, and larger than most Indian trade beads of the colonial period. Diameter ranges from 3.5 mm. to 14 mm. with the average at 6.2 mm. (Table I). In the Nueva Cadiz sample of badly patinated specimens, there were two modes at 4.5 mm. and 7 mm. respectfully. As all these specimens were badly deteriorated, it is possible that at least one millimeter should be added to the dimensions in order to approach the original size. In the sample from Isla de los Muertos about 75% of the beads fall between 4 and 5 mm. in diameter. The largest specimen with a diameter of 14 mm. was the only specimen found at Valentim, Brazil (Meggers and Evans 1957: Fig. 11a).

In respect to length considerable variation was found as is seen in Table II. Much of this variation may be due to the heavily patinated state and the presence of many broken specimens in the Nueva Cadiz sample. In that collection, only beads with cleanly cut ends were presumed to be complete. The two series from Nueva Cadiz and Isla de los Muertos showed considerable variation in length, with the combined samples having a range of from 37 mm. to 75 mm. The Nueva Cadiz sample had a range of from 37 mm. to 46 mm., with one specimen outside the group at 51 mm. length. In the Isla de los Muertos sample only two specimens fell within the Nueva Cadiz range, being 41 mm. and 41.5 mm. long. The total sample showed a range of 41 mm. to 71 mm., with the mode at 53 mm. The Peruvian specimens seem

quite comparable to the Isla de los Muertos range. The longest known specimens are 75 mm. in length, one from Valentim, Brazil, the other from Treasure Island, Canal Zone, where very few beads of this type have been found.

Perforations ranged from 1 mm. to 2.5 mm. in size. It appears that the size of the hole was proportionate to the diameter of the bead, as is the case with most cane beads.

While many of these early beads are considerably changed from their original colors, it is usually possible to come to a fair idea of the original colors. The commonest metal is certainly a clear glass. Next in popularity are, in order, navy blue, either solid or overlaid on clear glass or over an opaque white base; a multi-layered robin's-egg blue. This latter form shows some variation being a light, clear blue overlying either clear glass, over white and brown layers, over white and clear layers, or over white and blue. In some cases patination has somewhat lightened the blue color. Rich emerald-green and cobalt blue beads are occasionally found, but neither color is very common. In the Huron area of Lower Canada an opaque red form is found that does not seem to occur elsewhere.

The custom of using multi-layered gathers of glass was quite typical of the best late Medieval glass work. In this case the purpose does not seem clear. Where clear or translucent blue lies over opaque white it results in a very rich, brilliant color. Something of the same effect is achieved where a clear metal overlies the blue color. It may be, of course, that the blue glass was so expensive that it was desirable to use cheaper glasses for the interior concealed parts of the bead.

These are clearly skillfully-made beads, although the precise steps in manufacture are far from clear. They seem definitely to be cane or drawn beads as the glass shows minute, longitudinally elongated vesicles which are so characteristic of this method of manufacture. Goggin felt that they were drawn through a die with a square aperture as the diameters are usually very close to precise squares. He also considered that the drawn canes could have been marvered to a square shape while still plastic. Considerable research in Medieval glass-making techniques has failed to reveal any evidence of drawing glass through dies in this fashion. The relatively long beads are quite regular in shape and do not suggest marvering after drawing. Discussions with Paul Perrot and Robert W. Brill of the Corning Museum of Glass suggest that the gather was first marvered into a square shape and then drawn into canes. The fact that the holes show no distortion strongly supports the view that this was probably the method of manufacture. In some cases the corners at the end were slightly faceted at an angle. In this respect they resemble a related type, Peru Corner Faceted.

Nueva Cadiz Plain is commonly found associated with Nueva Cadiz Twisted, Peru Corner Faceted, seed beads, and Chevron Beads. The type is found from Alabama to the Argentine with the heaviest concentration being found in Peru. This latter occurrence may be due in large part to the intensive collection which has taken place in that rich archaeological area. A single specimen is known from Ogiltree Island, Alabama (Morrell 1964).

Florida examples were found at Ortona Mound, Murphy Island, and Lake Butler. Caribbean sites are Alta Telamanca, Mercedes, and an unspecified site in Costa Rica; Isla de los Muertos, Nicaragua; and Juandolio, Dominican Republic. A single example is reported from Mexico. A number of specimens have been found at Treasure Island and Lower Chinaman's Island, Canal Zone. South American sites include Valentim, Brazil; Neuva Cadiz, Venezuela; Hacienda Monterey, Colombia; an unspecified Bolivian site (No. 1); Rio Chico, Santa Cruz, and an unspecified site in Argentina. Peruvian occurrences are numerous and include the following: Hacienda San Nicolas, Supe; Chan Chan; Hacienda Casa Grande, Chicama Valley; Mocce, Lambayeque; one unspecified "middle coast" site; three unspecified "central coast" sites; and seven general unspecified sites. In addition there are evidently a large number of Nueva Cadiz Plain beads incorporated in Colonial Spanish gold jewelry from the Peruvian area.

Aside from the sites which fall within the Spanish Colonial zone there is another area where similar beads are known in some quantity. This is Lower Canada where they must derive from the French. Judging from illustrations, descriptions, and museum specimens they seem to have been found at Ste. Marie I (Kidd 1949: 142, Fig. 25N), St. Louis (Jury and Jury 1958: 38), and Beverly (Schoolcraft 1851-7, I: Pl. 25, 9-10). The specimens from Huronia differ from the Spanish ones in that an opaque turkey red is the predominant color, now rather dull on the surface. Examples in the Royal Ontario Museum at Toronto are from Ossassane in Simcoe County (Quimby 1966: 83-5, 183-4, Fig. 16). In the Huron sites they are associated with a variety of glass beads and a number of square, tubular beads of catlinite. The catlinite beads and the red variety of Nueva Cadiz Plain are

remarkably similar in appearance. As the catlinite beads have very small perforations, they were probably drilled with metal tools. On this basis we may speculate that the catlinite beads copy the glass beads, rather than the reverse.

In spite of careful search no comparative material of this type could be found in Spain; nor, on the other hand, were any glass beads of the 16th and 17th centuries seen. Nueva Cadiz Plain and Nueva Cadiz Twisted were seen, however, in two Portuguese collections. A string of seven beads, four Nueva Cadiz Plain and three Nueva Cadiz Twisted were in an unlabeled case at the Museu Arqueologico in Lisbon. The accompanying material appeared to be late Medieval in date. In the Museu Etnologico in Lisbon (Cat. No. 11,170) is a string of beads from Bensafrim, Ponte Velja which includes many chevron bugle beads, other bugle forms, and a single Nueva Cadiz Plain bead.

The archaeological position seems to be clearly the 16th century and perhaps the early part of the 17th century. The bibliography is extensive. Cruxent and Rouse 1958-9, II, Pl. 3, 16; Quimby, 1966: 83-5, 183-5, Fig. 16; Hartman 1901: 21, Pl. 5, Fig. 7; Jury and Jury 1958: 38; Kidd 1959: 142, Fig. 25N; Meggers and Evans 1957: Fig. 11a; Morrell 1964; Mugica Gallo 1959; Pls. 116,117,118; Schoolcraft 1851-7, I: Pl. 25, 9-10. This distinctive bead, along with the related Nueva Cadiz Twisted and Peru Corner Faceted, stands out from all other glass beads found in the New World. The square cross-section and great length are good sorting markers. The robin's-egg blue is highly distinctive and might be designated Nueva Cadiz Plain, Variety A. The opaque red form from Hurona might be designated Nueva Cadiz Plain, Red Variety.

Nueva Cadiz Twisted

As is the case with Nueva Cadiz Plain, this is a large bead when compared to both modern examples and to Indian trade beads. Again it is a long, square bead which differs from Nueva Cadiz Plain in being twisted along its axial length while still plastic. In the Beck classification it is a Twisted IX.D.2b shape. There is some variation in dimensions, with this sample (48 measured specimens) having somewhat more restricted ranges than the Nueva Cadiz Plain sample. Some clustering is apparent in the different collections, with the sample from Nueva Cadiz being on the larger end of the range. Diameter varies from 3 mm. to 9 mm. (Table III). In length the range runs from 37.5 mm. to 61.5 mm. with the small Nueva Cadiz sample on the short end of the range and the other collections spread across the range (Table IV.). Perforations range from 1 mm. to 2.5 mm. as in the Nueva Cadiz Plain sample.

In general color is much as the previous type. In the sample from Nueva Cadiz, eight of the ten specimens are navy blue, one is cobalt blue, and is dark navy blue, over white, over brown. It is possible that some of the solid blue specimens may actually be multi-layered, all are heavily patinated and colors are somewhat obscure. The Murphy Island specimens are all multi-layered robin's-egg blue over opaque white or black or dark blue. The Hacienda Monterey and Grantham Mound specimens are very similar. The bulk of the Isla de los Muertos and Peruvian examples are like this latter multi-layered form with occasionally a clear glass center instead of the dark blue core. The opaque white layer beneath the robin's-egg blue surface gives a great brilliance to these beads. The Peruvian beads, often in almost mint condition, are extremely attractive beads. A few specimens

have what, at first glance, appear to be inlaid stripes at the corners. This is simply the thinning of the surface layer which allows the inner layer to show through.

The beads are made from either simple or multiple gathers of glass, made into canes by a blowing and drawing process. Most show longitudinally elongated vesicles which indicate this drawing process. Again, the precise technique of manufacture is far from clear, although marvering of the gather into a square shape before drawing seems the most likely.

Nueva Cadiz Twisted is commonly found associated with Nueva Cadiz Plain, Peru Corner Faceted, seed beads, and chevron beads. It occasionally occurs with other forms, as at Hacienda Monterey.

The type is found from Florida to the Argentine. Florida examples are from Murphy Island and Grantham Mound. Other locations are: Isla de los Muertos, Nicaragua; Changuina and one unspecified site in Costa Rica; Juandolio, Dominican Republic; Hacienda Monterey, Colombia; Valentim, Brazil; Treasure Island, Canal Zone; La Compania, Ecuador; an unspecified site (No.1) in Bolivia; and Rio Chico and Gainan, Argentina. The identification of the specimens from Changuina, Costa Rica, is not certain but appears highly probably although the illustrations are unsatisfactory (Stone 1958: Fig. 1,D, opposite p. 50). In her description Stone refers to "millefiore beads of twisted bluish glass" (1958:45), a description apparently derived from Hartman's (1901:21) earlier description of a Nueva Cadiz Plain bead. The largest concentration at Cajamaraquilla; Mocce, Lambeyeque; Ancon: a "middle coast" site; a "central coast" site, and four unspecified sites.

As with the previous type, there is a second concentration of these beads in Huronia. Judging from illustrations, descriptions, and museum

specimens, they appear at Ste. Marie I (Kidd 1949: 142, Fig. 25, O,P), Beverly, Ontario (Schoolcraft 1851-7, I; Pl. 25, 12); Dutch Hollow, New York (Kidd 1954); Erie, Pennsylvania (Carpenter, Pfirman, and Schoff 1948: 8); and the Ossassane Site in Simcoe County, Ontario (Royal Ontario Museum, Cat. No. 5643). It appears that the Nueva Cadiz Plain and Nueva Cadiz Twisted specimens from Huronia are very frequently, if not predominantly, red, while those from Spanish sites are usually blue, often in some combination of white or clear. There seem to be no twisted long, square, catlinite beads which are as directly comparable as those which seem to be copies of Nueva Cadiz Plain. I do not feel that the contrast in colors between the two areas represents any color preference of the Indians of the two regions. It probably does reflect differences in color preferences in the areas of manufacture. Thus the Spanish and Canadian styles represent two samples of a common horizon style, but were probably made in different centers. The robin's-egg blue specimens from Dutch Hollow and Simcoe county differ from Spanish Colonial specimens in having a opaque red core, a form not yet seen in the South.

These beads seem to have clustered in the 16th century with perhaps some extension into the early years of the 17th century. Nueva Cadiz Plain and Nueva Cadiz Twisted have a clear cut temporal position. The examples from Huronia have a slightly later position. Examples of Nueva Cadiz Plain from Juandolio, Dominican Republic and numerous specimens of both the plain and twisted types from Nueva Cadiz, abandoned in 1545, clearly place the type early in the 16th century. The Peruvian specimens are believed to date from the period immediately after the conquest. The Florida examples, for various reasons, suggest a range continuing into the late 16th century.

The specimens from the northeast are associated with Huron or Iroquois sites. Beads from Dutch Hollow probably date from the very end of the 16th or the beginning of the 17th century. Those from Ste. Marie I presumably date after the founding of that site in 1639 and before its destruction by the Iroquois in 1649. The few examples found in this last site could, of course, have been heirlooms acquired by the Huron some years earlier. Certainly the date 1649 for the destruction of Ste. Marie I is a firm terminus ante quem for the type.

The bibliography is extensive: Carpenter, Ffirman, and Schoff 1949: 8, Pl. 2, 6; Cruxent and Rouse 1958-9, II: 2,15; Goggin 1952: 126; Kidd 1949: 142, Fig. 25, O,P; Meggars and Evans 1957: 58, Fig. 11a; Mujica Gallo 1959: Pla. 116-8; Stone 1958: 45, Fig. 1, D, opposite page 50.

This, like the Nueva Cadiz Plain, stands out in size, shape and color from any other glass trade beads in the New World. Among the gifts given by Cortez during the conquest of Mexico were "twisted glass beads" (Diaz del Castillo 1958:71). It seems highly likely that these were our type Nueva Cadiz Twisted. Colonial gold and silver jewelry from the Andean area incorporates beads of this type (Brooklyn Public Museum; Mujica Gallo 1959: Pls. 116-8) and it seems likely that these were types of beads worn by the Spanish themselves. No specimens have been found set on chains as is usual with rosaries. The robin's-egg blue form, because it is so distinctive should, unless it has an opaque red core, be designated Nueva Cadiz Twisted, Variety A. The opaque red form should probably be counted as Nueva Cadiz Twisted, Red Variety.

Florida Cut Crystal

This is a distinctive but highly variable bead made of clear crystalline quartz, often called rock crystal. Most examples can be described as a short bead characterized by surface faceting, spiraling or sculpturing. In the Beck shape classification the most common form would be XIX, A.9. The most common treatment was the cutting of from four to six rows of flat facets on the surface. The rarest form is the sculpturing of raised bosses or other designs on the surface. Single examples of beads with a plain smooth surface are known from the Seven Oaks and Fuller Mound A sites in Florida. The surface was normally finished free of blemishes and has a high polish. Many beads, however, show scratches and scars from prolonged use. Occasional beads are found which show so much wear as to suggest deliberate attempts by the Indians to grind off the sharp angles between adjacent facets or spirals. The beads are made by lapidary techniques which show a great deal of sophistication.

The largest sample available for detailed study consists of five beads from the Seven Oaks Site, Florida. A larger collection from Ft. Center, Florida is known to exist. They measure as follows:

Plain surface	11 x 12 mm.
Spiral cut	11 x 16.5 mm.
Faceted	8.5 x 12 mm.
	10 x 12 mm.
	12 x 17 mm.

A specimen from the True Site is somewhat larger, measuring 13.5 x 21 mm. From Horrs Island there is one specimen measuring 7 x 10 mm. It is my impression that the twenty specimens, that I have only briefly seen, from Ft. Center would all fall within this range. A somewhat differently

proportioned one from Fuller Mound A measures 27 x 11 mm. (Hause 1951: Pl. 8, I). Perforations range from 1 mm. to 1.5 mm. The color in all specimens is a water-clear, transparent crystal. Some specimens show flaws, inclusions, and other structural lines.

Using lapidary techniques, the bead was cut from crystalline quartz, shaped, and faceted. The cutting medium for quartz, with a hardness of 7.0 in the Moh Scale, is not known. It may well have been quartz powder used much as diamond dust is used to cut diamonds. The perforation was drilled from one end, leaving a parallel-sided hole. At each end of the perforation is a shallow pit with conchoidal fracture ripples. One of these pits must have been delicately struck to start the drill, the other when the drill broke through as the perforation was finished.

Florida Cut Crystal beads are most commonly associated with chevron, gooseberry seed, and similar beads. They are not found on sites with Nueva Cadiz Plain or Nueva Cadiz Twisted beads. At a number of sites in southwestern Florida the type occurs with Florida Coin Beads, as at Ft. Center. The Florida Coin Bead was locally made, by either Indians or shipwrecked mariners, from Spanish silver coins. This suggests that these crystal beads may have been primarily salvage or loot.

The type is most typically found in Florida, occurring at Goodnow Mound, True Site, Seven Oaks Site, Lake Marion, Punta Rassa, Cayo Palu, Curiosity Hammock, Bee Branch, Johns Pass Mound, Lake Butler, ^Horrs Island 5, Orange County, Fuller Mound A, East Lake Tohopekaliga, and Ft. Center. Outside of Florida the type appears to be rare. A single specimen has been seen from Jamestown, Virginia (Bushnell: 1937 27-35, Pl. 1). They appear to be

examples of our type, yet they are associated with a variety of striped beads, as well as "Bristol Beads", called by De Jarnette Georgia Milk Oval (De Jarnette and Hansen 1960: 57). This type is highly typical of English sites of the 18th century. The significance of the Virginian occurrence is far from clear but suggests that they may have been heirlooms. On the basis of the Florida associations, this type appears to date from the middle 16th century and part of the first half of the 17th century. The Virginia specimens seem to date from the late 17th century and the middle of the 18th century.

A closely related type is known from Florida mission sites such as Pine Tuft. These are somewhat smaller, are faceted, and always are small ovate pendants with a transverse hole near the apex. These may actually belong to the basic type but they do differ in a number of attributes and are considerably later, dating from about 1700.

References are not especially abundant: Bushnell 1937: 27-35, Pl. 1, two bottom rows; Griffin and Smith 1948: 14, 29; Rouse 1951, Pl. 8, G-I; Smith 1956: 67.

This is a rather surprising bead to find in any quantity in Indian sites. It must have been quite expensive as its manufacture involved highly skilled techniques of faceting, drilling, and polishing. It, therefore, hardly seems designed for the Indian trade as were many of the rather crudely-made glass beads associated with it. I am inclined to believe it was imported as personal possessions by the Spanish. They may have come into Indian hands through salvage of shipwrecks as loot from stranded mariners, or have been bartered in exchange for captive mariners, or for

gold looted from the wrecks by Indians. The noticable concentration in the Lake Okechobee Basin and the west coast strongly suggests that they formed part of the tribute which the east coast Indians sent periodically to the Calusa.

Johnson says that in 16th century Spain rock crystal "was popular with connoisseurs of the Renaissance. Holding a prominent place among the applied arts of the Middle Ages, crystal carving reached in this period a development of even greater perfection" (1938: 198). Quartz crystal cutting was related to work in the much softer jet as both were heavily faceted. One center was traditionally near Ronceveaux, where Roland so heroically died.

This type should not be confused with marvered or molded faceted beads of glass so typical of the late 18th century or early 19th century, such as Tallasseechatchee Transparent Decahedral (De Jarnette and Hansen 1960: 57). These authors cite Woodward's dating of 1600 for their glass bead type and state that ground facets are later. This is not supported by the Florida evidence.

Figure 1

Left: Nueva Cadiz Plain

Right: Nueva Cadiz Twisted

Figure 2

Florida Cut Crystal

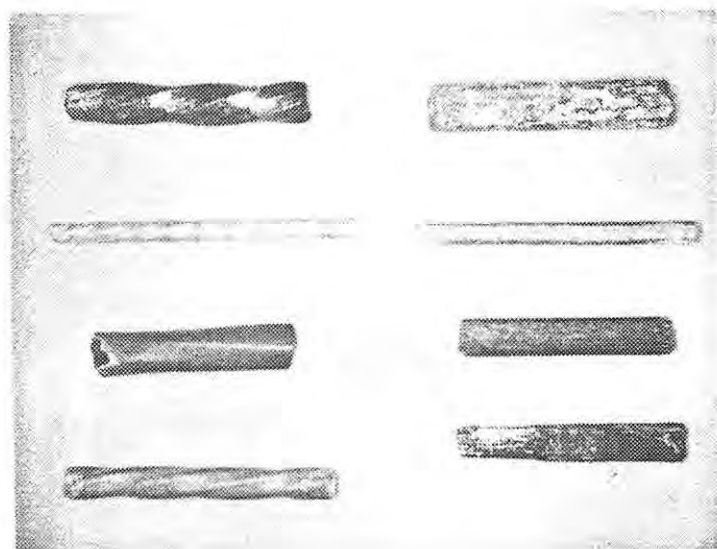
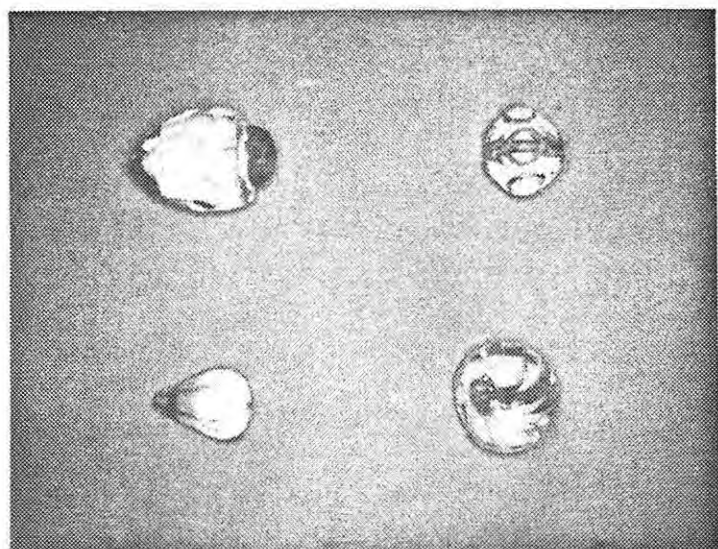


TABLE 1. DIAMETER OF NUEVA CADIZ PLAIN BEADS

Site	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	8.0	8.5	9.0	10.0
Nueva Cadiz		4	1	7	1	4	4	12	5	1	1	1
Isla de los Muertos	2	11	6	7	3	1		1	1			

TABLE 2. LENGTH OF NUEVA CADIZ PLAIN BEADS

	Nueva Cadiz	Isla de los Muertos
37.0	1	
38.0	1	
40.0	8	
41.0	3	1
41.5	4	1
42.0	1	
43.0	1	
44.0	1	
45.0	1	
46.0	1	
47.0		1
48.0		1
49.0		1
50.0		1
50.5		1
51.0	1	1
52.0		1
52.5		1
53.0		2
53.5		1
54.0		1
54.5		1
55.0		2
57.5		1
62.5		1
68.0		1
69.0		1
71.0		1

TABLE 3. DIAMETER OF NUEVA CADIZ TWISTED BEADS

Site	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
Nueva Cadiz					1	1	1		2	1	2		2
Isla de los Muertos	1	1	6	1	7	4	6						
Peru					2	2	1	1	3	1		1	
Florida											1		
TOTALS	1	1	6	1	10	7	8	1	5	2	3	1	2

TABLE 4. LENGTH OF NUEVA CADIZ TWISTED BEADS

	37.5	41.0	43.0	44.0	45.5	46.5	47.0	47.5	48.5	49.0	49.5	50.0	51.0	51.5	52.0	52.5	53.0	53.5	54.0	56.0	56.5	58.0	60.0	60.5	61.5
Nueva Cadiz	1	1	1																						
Isla de los Muertos							3	1	1	2	1			4	3	1	1	1	2	2	1			1	1
Peru			1	1	1							1	1	1								2	1		
Florida						1				1															
TOTAL	1	1	2	1	1	1	3	1	1	3	1	1	1	5	3	1	1	1	2	2	1	2	1	1	1

BIBLIOGRAPHY

- Beck, H.C.
1928 "Classification and Nomenclature of Beads and Pendants." Archaeologia. Society of Antiquaries of London, Oxford.
- Bushnell, David I.
1937 "Indian Sites Below the Falls of the Rappahannock." Smithsonian Miscellaneous Collections. No. 94, Washington.
- Carpenter, F.S., K.R. Pfirman, and H.L. Schoff
1949 "The 28th Street Site." Pennsylvania Archaeologist. Vol. 19, No. 1, pp. 3-16.
- Cruxent, J.M. and Irving Rouse
1958-59 "An Archaeological Chronology of Venezuela." Pan American Union Social Sciences Monograph. No. 6, 2 Vols., Washington.
- De Jarnette, David L. and Asael T. Hansen
1960 The Archaeology of the Childersburg Site, Alabama. Florida State University, Notes in Anthropology, No. 4, Tallahassee.
- Diaz, del Castillo
1956 The Discovery and Conquest of Mexico, 1517-1521. New York.
- Goggin, John M.
1952 Space and Time Perspective in Northern St. Johns Archeology, Florida. Yale University Publications in Anthropology, No. 47, New Haven.
- Griffin, John W. and Hale G. Smith
1948 The Goodnow Mound Highlands County, Florida. Containing a Report on the Skipper Site, Highlands County. Contributions to the Archaeology of Florida. No. 1. Florida Board of Forestry and Parks, Florida Park Service, Tallahassee.
- Hartmann, C.V.
1901 Archaeological Researches in Costa Rica.
- Jury, Wilfred and Elsie McLeod Jury
1955 "St. Louis: Huron Indian Village and Jesuit Mission Site." Museum Bulletin No. 10, pp. 1-76. Museum of Indian Archeology, University of Western Ontario. London, Ontario.
- Kidd, Kenneth E.
1949 The Excavation of the Ste. Marie I. Toronto.

BIBLIOGRAPHY (Continued)

- Kidd, Kenneth E.
1954 "Trade Goods Research Techniques." American Antiquity.
Vol. 20, No. 1, pp. 1-8.
- Meggars, Betty J. and Clifford Evans
1957 "Archeological Investigations at the Mouth of the Amazon."
Bureau of American Ethnology, Bulletin 167, Washington.
- Morrell, L. Ross
1964 "Two Historic Island Sites in the Coosa River." Florida Anthropologist. Vol. 17, No. 2, pp. 75-6. Gainesville, Florida.
- Mujica Gallo, Miguel
1959 The Gold of Peru. Masterpieces of goldsmith's work of pre-Incan and Incan time and the colonial period with an introduction by Raul Porros Barrenechea. (Trans. from Spanish by Roger Peniston-Bird.) Recklinghausen.
- Quimby, George Irving
1966 Indian Culture and European Trade Goods. The University of Wisconsin Press, Madison, Milwaukee, London.
- Rouse, Irving
1951 A Survey of Indian River Archeology, Florida. Yale University Publications in Anthropology, No. 44, New Haven.
- Smith, Hale G.
1956 The European and the Indian. Florida Anthropological Society Publications, No. 4, Gainesville.
- Stone, Doris L.
1958 Introduction to the Archaeology of Costa Rica. San Jose, Costa Rica.

Restoration Study at the Paca House, Annapolis, Maryland



HISTORY

C.W. Peale Portrait of William Paca Showing valuable clues for the Garden Restoration. (Painting owned by the Peabody Institute; on Permanent Exhibition at the Maryland Historical Society, Baltimore)

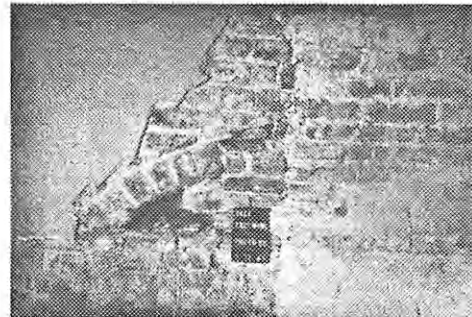


The Photograph of The Paca House before the East Wing was raised in 1890, provides important restoration data. (Library of Congress Photograph)

ARCHITECTURE



West Wing fireplace showing eighteenth, nineteenth and twentieth century construction.



The remaining section of the original kitchen fireplace arch, revealed when plaster was removed from the East Wing Wall



The East Wing wall inside the twentieth century bay showing the Paca House construction over an earlier wall.

ARCHAEOLOGY



Oyster Shell Midden inside the twentieth century bay of the East Wing, containing eighteenth century artifacts of the Paca Period, from 1763 to 1780.



Pre-1763 Foundation Wall on which the Paca House East Wing was constructed, showing the inlet for the Drain through the brick wall.



Excavated area behind the West Hyphen showing the nineteenth century walk over bricks from an eighteenth century drain.

RESTORATION ARCHAEOLOGY AT THE PACA HOUSE
ANNAPOLIS, MARYLAND

Stanley South
N.C. Dept. of Archives and History

In 1965, Historic Annapolis, Inc. acquired the large brick structure that had once been the home of William Paca, signer of the Declaration of Independence. In the twentieth century the building had been the front of a large hotel known as Carvel Hall. This hotel has been razed, and restoration of the Paca House and garden is under way. The architect responsible for the restoration of the house is James Burch, AIA, who has been carrying out a detailed examination of the structure for many months. Realizing the need for archaeological work to accompany the study his office was making of the building itself, Mr. Burch, through Contract Archaeology, Inc. of Alexandria, Virginia made plans for a combination study designed to reveal information about the house and its occupants through historical and archaeological research. Although originally conceived as a team effort involving an historian and an archaeologist, this writer agreed to carry out both studies in a four month period, as well as recording, through photographs, the evidence being examined by the architects in the house itself. The work was done on a sub-contract basis for Contract Archaeology, Inc.

This approach of combining the information produced through architectural examination, historical research, and archaeology, represents the ideal situation for the study of an historic structure for the purpose of restoration. All possible care and deliberation is being exercised in the study of this building, and only after all the evidence has been

gathered will the architect finally attempt to make his working drawings for the restoration. A complete report on the historical research, the archaeological work, and the photographic study of the architectural clues has been written and turned over to the architect. This volume constitutes one of the cornerstones for the restoration, a necessary one in competent efforts at the preservation of our heritage through historic structures. This paper is a review of the work carried out on this project from June through September, 1967.

The Paca House is a large brick country house built on Prince George Street in Annapolis, representing only one of a number of fine homes built in the mid-eighteenth century by gentlemen of wealth and position in that city. The historical research revealed that it was built by William Paca, beginning in 1763, and was probably completed enough for occupancy by 1765. It was the home of William Paca and his wife Mary Chew until her death in 1774. After that time Paca was away from Annapolis a great deal, concerned with the affairs of the Continental Congress in Philadelphia. He sold the house, in 1780, to a fellow attorney, Thomas Jenings, who made it the home for his family until his death in 1796. The Jenings heirs rented the house to Baron Henri de Stier in 1797, who was the only aristocrat ever to live there. Throughout most of the nineteenth century the house was rental property, serving during the last quarter of that century as a boarding house, and climaxed as rental property by the construction of Carvel Hall Hotel shortly after the turn of the twentieth century.

In 1878, the west wing was raised an additional floor, and in 1890 the east wing and hyphen were also raised to accommodate more boarders. These additions will be removed, and the kitchen wing and the office wing restored to their original one-story-and-garret appearance. During the removal of nineteenth century lathing in the ceiling of the main house, the architect discovered a note placed there by a carpenter who was carrying out alterations. This note stated, "This attic story was finished for Mrs. Dr. Kennedy By James L. Taylor, Carpenter, June 1885." It was Mrs. Kennedy who operated the boarding house.

The historical research was carried out in Annapolis, Washington, Philadelphia and Baltimore, in order to recover as much data as possible about the occupants of the Paca House, with emphasis, of course, on William Paca. The Paca family history was followed into the mid-seventeenth century to William Paca's great grandfather, Robert Peaker. The next step in this direction would be research in three counties in England where the Peaker family is located. Along with the genealogical research emphasis was placed on personal interests and qualities of the man William Paca, such as his interest in the Jockey Club, and his membership in an early social group known as the Homony Club. His activities in the field of public affairs as a prominent lawyer and judge, signer of the Declaration of Independence and governor of Maryland were not emphasized in this study since these phases of the activity of the man have been frequently covered by historians.

Of particular interest in regard to the formal garden known to have been located at the rear of the Paca House is the painting by Charles W. Peale of Paca, in the background of which there is a two story summer house, a smaller house (probably the bath house), a bridge with a Chinese Chippendale

motif railing, and a brick wall with vertical slots along its length. A photograph made from the dome of the Maryland State House in the late nineteenth century reveals the fact that a slotted brick wall such as shown in this painting separated the Paca House garden from King George Street. From this correlation we know that the scene depicted by Peale was indeed at the Paca House on Prince George Street, and from this the architect and the landscape gardener, are able to obtain valuable information for restoration of the garden.

Of similar value are sketches made of the Paca House by F.B. Mayer in 1872, and photographs taken before the east wing and hyphen were raised in 1890. These are significant to the architect responsible for the restoration, providing information not available elsewhere.

The architectural study has involved the removal of floors to reveal earlier floors, removal of reinforced concrete floors to reveal old ground surfaces beneath, under which archaeological work was then carried out, and removal of later wall surfaces to reveal those earlier ones beneath. The archaeologist and architect literally worked side by side in the examination of hearths, walls, and floors in an effort at understanding the story to be revealed at the Paca House.

Through removal of plaster from walls, old doorways were revealed, as well as clues to original positioning of windows and floor levels. Study in the top floor of the main house revealed that there had originally been five dormers instead of the three there today. The outline of shelving against the exterior of the main house, with eighteenth century type plaster applied after the shelves were in place produced evidence pointing toward an eighteenth century date for the wide cast hyphen. This is the sort of evidence being studied in the architectural examination of the house.

The archaeological goals were to establish the original grades in the area of the Paca House, both those present at the time construction began, as well as the grade originally established after construction of the house was complete. Through a series of squares all around the house this information was revealed. The area of the Paca House was an orange clay hill at the time construction began in 1763, no original topsoil being found in place anywhere on the site. Because construction was beginning at a subsoil level, ie. on a hard compact clay, the builders felt that there was little need for construction ditches, and sat the building on the surface of the ground in most instances, adding fill against the house after construction was completed in order to landscape the area and force drainage away from the building.

Besides the goal of determining original grades, the discovery of the function of the two wings was desired, as well as the recovery of information relative to walks, old entrances, and any other features of significance that would aid in an understanding of the history of the house. Many questions were asked by the architect and the archaeologist, but only a small percentage were able to be completely answered, as is usually the case. New questions were also raised in the process of answering others.

During excavation at the rear of the west wing a brick surface drain was found two feet below present grade. This drain passed beneath a later brick lined walk containing mid-nineteenth century objects. In one area the drain had been partially removed in order to construct a plant bed, the outline of which could be clearly seen against the orange clay subsoil. The plant bed contained numerous fragments of wall plaster, along with ceramic

types dating from 1790 to 1805, indicating that repairs were very likely made to the house during this period. From the historical records we know that Baron de Stier made repairs to the house in 1797 and 1798, and from this we might conjecture that it was from these repairs that the plaster came to be in the plant bed. We know also, that the Baron brought his own gardener with him from Antwerp, Holland when he came to America.

From the work around the west wing we find that almost no kitchen midden material was throw into the yard here, ruling out this wing as the kitchen. However, in front of the west wing a walk of coal ash was discovered leading to a window. From an examination of this area of the brick wall beneath the window, it became apparent that a window had originally been here, and that it had been converted into a doorway, then back into a window again. From artifacts lying over the walk it was possible to determine that the change from a window to a door had occurred during the second decade of the nineteenth century, during the ownership of the house by Lewis Neth.

In front of the west hyphen a walk composed of oyster shells was found. Among these shells was a quantity of broken china dating from 1790 to 1805, indicating the period for the accumulation of this midden. The period of its accumulation would indicate that it was likely taken from a midden deposit of Thomas Jenings who lived in the house from 1780 until his death in 1796, or possibly from a midden accumulated during the occupation of the house by Baron de Stier from 1797 to 1800. The walk was likely built during the ownership of the house by Lewis Neth, and may have been constructed of shell from his own midden deposit of the first decade of the nineteenth century.

It was not until excavation was carried out to the east of the east wing of the house that material was found that could definitely be associated with the builder of the house, William Paca. Here, beside the door to this wing, a pile of oyster shells was found. Mixed with the shells and bone were fragments of Oriental porcelain, salt-glazed stoneware, delft, faience, and creamware, all types of the 1760's and 1770's, definitely establishing this deposit as that accumulated during the occupation of the house by William Paca. This midden was found to extend along the side of the house, beneath twentieth century bays that had been added to the wing. The presence of this deposit here definitely established this wing as the kitchen.

Of particular interest here was the discovery that this wing was built on the stone foundation of an earlier structure, the early building having been some feet shorter than the Paca House wing. Another significant discovery was the fact that a drain passed from inside the wing through the brick wall, and into an underground pipe made of bricks. This drain was stopped up by oyster shells that had been thrown into the drain opening, causing a slowing of the drainage. Gradually it completely stopped with fish bones, scales, and other small fragments from the kitchen. From the ceramic fragments recovered from this drain it became apparent that it was not used as a drain much after 1785, and therefore was apparently clogged during the use of the house by Thomas Jennings.

During the excavation inside the east wing a small brick storage box was found in the position that was just beneath the original stairs to the garret. This was apparently a secret hiding place, perhaps used by certain

trusted servants. From excavation in the area of the east wall of the east wing a fault line was revealed, paralleling the wall, with an open crack occurring at the edge of the original construction ditch. This open crack in the soil was seen as a result of the raising of the wing in 1890, at which time a greater weight was added to the foundation wall, causing it to tilt slightly outward due to the fact that the brick bearing wall sat on the outer edge of the original stone foundation. As this wall gradually leaned out during the years after 1890, cracks appeared, and it showed signs of possible collapse. It was in the early years of the twentieth century, therefore, that the owners apparently saw the necessity of somehow buttressing the east wall to prevent its collapse. To do this they constructed two bays, which, in effect, provided four buttressing walls, supporting the leaning wing wall. From this interpretation of the fault seen in the ground, plus a study of the wing wall itself, the archaeologist was able to recommend to the architect that during restoration of this wing, these buttresses be left in place until the second floor weight was removed, then, with the lower floor strengthened, the buttressing bays could then be safely removed.

Excavation in the front yard of this wing revealed a brick cistern sealed with a stone placed over the cemented dome. When this stone was moved it was found that the cistern was twenty feet deep, and had eight feet of quicksand inside. Pipes leading into the cistern were traced to the corner of the house, where they had once fed rain water from the roof of the house into the cistern. It was probably constructed in the nineteenth century. Fill over the capstone produced artifacts from the late nineteenth century, indicating that this was the period during which the use of the cistern was stopped. In this regard a reference dated 1893 indicates that

in that year the old well was capped at a cost of one dollar. The old well referred to was likely the cistern archaeologically revealed to have been capped in the last decade of the nineteenth century.

In front of the east hyphen another oyster shell walk was found, matching that on the opposite side of the house. Beneath this walk, as beneath the other, was evidence that the original walk had been of brick. This walk at present stops at a window, but closure bricks, plus 1790 to 1805 period ceramics in the walk point toward a doorway here at an early date, before the present window was installed. A brick steps was found here also, leading down to the lowered floor of the hyphen. This steps dates from the nineteenth century, however, the original doorway having been at ground level.

In front of the house and parallel with it the remain of a brick wall was found. This was apparently a low retaining wall, possibly designed to prevent erosion of the front yard of the house. It was torn down in the nineteenth century, and replaced by a brick wall closer to the street. The fact that this brick wall passed over one of the shell walks in the front yard allowed its construction date to be fixed. Beneath the wall, in the shell walk, fragments of creamware and pearlware were recovered that would indicate that the wall was constructed probably between 1780 and 1790, during the period of Thomas Jenings' use of the house, and was not built until after William Paca sold the house.

From this short summary of the work carried out at the Paca House in Annapolis during the summer of 1967, some of the problems and accomplishments of a restoration archaeology project are highlighted. As more work is undertaken by responsible agencies toward the restoration of historic

structures, an ever increasing need will be felt for historic site archaeologists who are skilled not only in the competent excavation and interpretation of archaeological sites, but who can undertake to correlate the information so gained with the architectural examination and historical documentation relative to a standing building. Thus, the historic site archaeologist's particular emphasis on the systematic recovery of data from the earth, interpreted through analogy with information recovered through historical research, and correlated with evidence revealed in standing historic buildings, enables him to meet the unique challenge of restoration archaeology.

FORT TOULOUSE,* FIRST INVESTIGATIONS, 1966

David W. Chase
The Montgomery Museum of Fine Arts
Montgomery, Alabama

Abstract

Fort Toulouse, known to the French of the time as "aux Alibamons" and to the English "Fort of the Alabamas", was constructed in 1717 at the order of the Louisiana governor, Jean Baptiste LeMoyne de Bienville. This wooden stockaded fort was located at the junction of the Coosa and the Tallapoosa Rivers in what is now central Alabama. The main purpose of this establishment was to frustrate the English in their attempts to expand westward. Thus it was a 'listening post' for troubles which might arise from either the Carolinas or from Florida where the Spanish still had power. Its secondary role was to keep the peace among the Creeks and Choctaws of the region. Abandoned in 1763 after the French and Indian War, the area came under British control, however, the British did not establish its own garrison in the fort. Its next military use was in 1814, when General Andrew Jackson occupied it and it became Fort Jackson. Shortly afterward, it was the site for the signing of the Treaty of Fort Jackson which ended Indian power in the Southeast forever.

Archaeological explorations of the fort area were begun in the summer of 1966 by the Montgomery Museum of Fine Arts. Investigations were initially conducted in fields to the south of the fort site proper. Evidence of an Indian settlement contemporary with the French fort was detected through the uncovering of features in exploratory trenches. This may have been the town of Pakana located "a musket shot" from the fort. A brick ruin was also uncovered during these investigations which seemed to have been one of the associated outbuildings.

* Note of Appreciation - The work at Fort Toulouse was accomplished through the volunteer services of members of the Montgomery Archaeological Society. Special thanks are due Mr. William Ross McQueen, Superintendent of Elmore County Schools who aided our project in many ways. For securing permission to excavate through the State Conservation Commission, I would like to express thanks to Mr. Lawrence Marks, Chief, Division of State Parks who has many times expressed a personal interest in the history and ultimate fate of Fort Toulouse as a public attraction.

The need for harmonious relationships with resident Indians was always a prerequisite to the establishment of colonial holdings for the competing European powers in the New World. This need, according to the governor of French Louisiana Jean Baptiste LeMoyne deBienville, could be satisfied through the establishment of outposts along the perimeter of the territory where such stations could dispense the warmth of friendship as well as maintain economic ties with the Indians. These posts could also serve as 'listening points' in the event trouble threatened from either the Spanish or English competitors. In what is now Alabama, two such military posts were established. The first, built at the mouth of the Coosa and the Tallapoosa Rivers where they join to form the Alabama, was Fort Toulouse. The post is noted on old maps by the French reference of the time as "les Alibamons" or "aux Alibamons", Toulouse was completed in the summer of 1717.

In the western part of the state at the junction of the Warrior and Tombigbee Rivers was built Fort Tombecbe at a much later date - 1735. Our concern is for the historical status and fate of Fort Toulouse in this review.

The rumblings of the Yamassee War had been quieted for only two years when the French Captain de la Tour* and his group of soldiers and Indians

* De la Tour was a Lieutenant when he had the assignment of building Toulouse. There is some reason to believe that he had been given this task as a punishment for certain behavior "unbecoming an officer" (Thomas, 1960)

journeyed up the Alabama River from Mobile to build an outpost for the territory. This was, in effect, an opportunistic move on the part of the French who wanted to gain the friendship of Indians who were becoming disenchanted with the treatment accorded them by the British in the southern colonies.

The first fort was built of logs, no doubt, and featured a palisade line 300 feet to the side and containing barracks and a magazine and a store house. A moat was also built around the fort (Thomas, pp. 150-51). In later years, civilians including women and children were known to have lived in the fort or in its vicinity.

The fort may have suffered the effects of a disastrous flood within five years after its initial construction and had to be re-built on a new site. At any rate, it was completely replaced or rennovated in 1734 (Thomas, p. 151).

Although the fort never became involved in a hostile attack, it did suffer internal difficulties on at least one occasion. Being a remote frontier post where the niceties of life immediately available to the soldiery in the Mobile garrison were entirely lacking and supplies were slow in arriving, the discomfort and loss of morale among the men stationed there can be well understood. In the year 1723, three non-commissioned officers and five men caused the garrison to mutiny (the complement at the post was about twenty-five to thirty officers and men). The officers were tied up and the fort ransacked. The mutineers escaped with the intention of reaching the English in the Carolinas, however, these men, numbering perhaps twenty or so, were all either killed or captured except for two who escaped (Thomas, p. 158).¹

¹ Cotterill gives date for the mutiny as 1721. p. 23.

Two wars contributed toward the termination of French colonial power in the New World. The first of these was King George's War (1744-48), and finally, the Seven Year's War, better known by historians as the French and Indian War. The latter conflict took place from 1756 to 1763. With influence and power gone, the French withdrew from their Alabama outposts of Tombecbe and Toulouse. The garrison hauled down the tricolor at Toulouse around November, 1763. Prior to their departure, they spiked their cannon and pushed them into the Coosa River. Some years later, some of them were recovered, unspiked, and used in 4th of July celebrations in Montgomery (Pickett, p. 194).

Because the Indians who lived in the vicinity of the abandoned French fort were hostile toward the English, the latter made no attempt to establish a military force there, however, the fort site or nearby Indian villages may have become the residence for the Indian agent for the Crown in the years prior to the Revolution.

After the disastrous (for the Indians) Battle of Horseshoe Bend, General Andrew Jackson marched his victorious forces to the junction of the rivers and re-built the old fort. General Thomas Pinckney, Jackson's superior at the time, named the new fort - Fort Jackson, in honor of Jackson's victory over the Indians. The American post then became the scene for the signing of the Treaty of Fort Jackson which was signed there in the month of August, 1814, and terminated the power of the Creek Indians forever afterward.

The fort remained manned until the early 1820's when it was abandoned and the lands put up for public sale.² An abortive attempt to locate a

² An early map dating to about 1820 indicates a sale of lands around the fort site at Cahaba on November 13-14, 1820.

community whose name was to be 'Town of Fort Jackson' was made after the public sale. The site, although never made into a modern community, did remain in private hands until quite recently. In 1912, the Alabama Society of Colonial Dames erected a marker, a ten foot high granite monument, on the site showing it as being the location of the old French fort. A smaller stone monument was placed on the site in 1915 in memory of General Andrew Jackson. In ceremonies held in June, 1961, the site was designated a historical landmark by the United States Department of the Interior and a monument indicating that fact was placed there in June, 1964.

Strong efforts to secure lands embracing the site for a public park have been made by a Wetumpka group of citizens. They organized under the name of The Fort Toulouse Memorial Park Association. Attempts were made on at least one occasion by that group to interest the National Park Service in establishing a federal park or monument on the site. At the time, the Horseshoe Bend National Park was being developed and administrative procedures apparently were not oriented toward incorporating another place in Alabama into the park system. The State of Alabama since 1963 has managed to acquire several tracts of land through negotiations with private owners or through condemnation proceedings and these include the fort site proper and the large prehistoric Indian site and mound which lies to the west of the fort.

In conjunction with the ultimate aim of the State of Alabama in making the site into a public park and historical monument, it was felt that some effort should be made toward the exploration of the area with a view toward locating actual building locations associated with the fort, as well as to recover artifacts which could be properly documented and placed in a museum which might be a part of future park development. Two situations

indicated a great need for this potential to be recovered as soon as possible. First, erosion of the Coosa River bank had accelerated over recent years and both Indian and historical site are threatened with severe damage and subsequent data loss; secondly, for a period of nearly thirty years, treasure diggers have been pillaging the nearby Indian site and mound to the point that there is practically no part of the latter area which has not been churned up by Sunday afternoon treasure seekers. For this reason, and because the well endowed graves have been exhausted for the most part. Mr. J.Y. Brame in a recent conversation told me that in the years 1920 through 1935 over 1,000 Indian graves had been dug on the site. Mr. Brame was a member of the Alabama Anthropological Society during that time. Attention is now being turned toward the historic fort site. At least one historic Indian grave was found by casual diggers recently who were armed with a mine detector and were "looking for coins".

In the summer of 1966, Mr. Lawrence Marks, Chief of the Alabama State Parks Division secured permission for the Montgomery Museum of Fine Arts to conduct limited explorations in and near the fort site. Initially, the open field to the south of the fort site proper was selected to confirm the historical reference to the 'Alabama village'"a musket shot" from the fort.³ This may have been the town of Pakana which, in later times may have moved further east along the Tallapoosa River.

³ Thomas, p. 153.

1966 Explorations

An exploratory trench laid out on a roughly east to west base line was established through the open field about 150' from the nearest known visible fort earthwork (at least two corner bastions and part of the north moat are still easily seen at the date of this writing). A total of five narrow (10 X 2 ft.) trenches were dug along this line and one additional trench along a north-south line at the south end of the field. These were designated Excavation Units I and II respectively. These trenches, together with shovel tests at various points in the field, indicated that both aboriginal artifacts, some prehistoric types included, and artifacts of European origin were compressed into the upper 8-10 inches over a well defined clay hardpan. Since the field had been under a long period of cultivation, there was practically no separation in terms of stratigraphy in this zone. The procedure then was to take a count of specimens by type from the upper zone over the hardpan in each section. In the process, a search for undisturbed features or penetrations into the clay substrata were sought for and in the over-all project, six were found.

The trenches were measured from a base point located at the western edge of the field of examination. Since the first trench on the base line measured from 50 to 60 feet along the line from the base stake, it was then identified as Trench or Section 50-60E. This series of trenches, five in all on the base line were considered as an excavation unit and termed Unit I. A second such excavation unit was begun to the south of the base line on a north-south (roughly) line which was perpendicular to the main base line. Only one 10 X 2 foot trench was taken out with two features exposed; this trench was Excavation Unit II (see Fig. 1).

An inventory of artifacts recovered from the upper zone in each trench is recorded in Table I. An inventory of contents of each feature is presented in Table II.

Feature Descriptions

Feature 1 This was a large, flat bottomed pit in Section 50-60E. This feature penetrated the clay hardpan to a depth of 12". It was circular and 6' in diameter. The fill consisted of very black clay-sand with flecks of charcoal and streaks of wood ashes throughout. Artifacts recovered from the pit proper (below disturbed ploughed upper zone) involved mostly Indian pottery of the Creek type; that is, rim and body sections which are identified as being in the Ocmulgee Fields and Childersburg classification range. Glass, porcelain, stoneware, faience, iron objects, gunspalls of the French type and brass objects were all of probable European origin. Two plain brass buttons may have been of a military type but there were no identifying marks to confirm this. Several kaolin type pipe stem fragments were contained in the feature. Two peach pits were also an interesting find. The latter were quite small but the identification was unmistakable.

In terms of the nature of both the Indian and European associated artifacts, there seems little doubt but that this important feature dates to the 18th century. Whole ceramic artifacts were lacking except for a restorable fragment of a Childersburg Incised bowl. On most historic sites except Fort Toulouse, the finding of faience or majolica type ceramics would be rare. In the typical contact site assemblage, trade china is invariably Staffordshire of the late 18th and early 19th Centuries. The keg hoop fragments pertained to small (roughly 14-16" diameter) kegs -

possibly used for transport of gunspalls, powder or musket balls. Brick fragments were not large enough to extract a good measurement.

Feature 2 This almost sterile pit was intercepted in Section 60-70E. It was 1' 9" deep and 3' 1" in diameter at the widest point exposed on the section floor. It was not completely explored and therefore its dimensions and nature can only be partially described. Only 16 objects were recorded from this feature which led to some speculation as to its purpose. The fill, like that of Feature 1, consisted of very black loose silt with some charcoal.

Feature 3 Located in Section 110-120E. This is represented by a scattering of bricks, 42 in all exposed. There were many more, but time did not permit a complete exposure. Mixed in and without doubt associated with the bricks as a probable part of the original structure, were eight large field stones, three being schist and the other being a hematitic sandstone common to the area. If the original structure had been a chimney or part of a house support, it would have seemed reasonable that some form of cement or plaster would have also occurred, but none was found. Some charcoal fragments together with animal bone - mostly domestic pig (*sus scrofa*) constituted the total range of faunal remains in the feature. Glass, iron and one blue on white soft paste ware which I identify as Delft were also found. The bricks were measured and the resultant measurement compared with the scale set up by Lazarus.⁴ The typical Feature 3 brick measured 8 X 3½ X 2 inches. Two reference areas for sample recovery come fairly close to the Lazarus bricks all of which were gathered from sites in the Pensacola Bay area. One type, listed as

⁴ Lazarus, 1965.

'Spanish tile' measuring $7 \frac{3}{4} \times 3 \frac{3}{4} \times 1 \frac{1}{4}$ inches with a source date of 1722-54. This date would be acceptable for a structure during the Fort Toulouse period, but the measurements are not close enough. The second type measures $8 \times 4 \times 2 \frac{3}{8}$ inches and is listed as an American brick with a time reference of 1838-77, entirely too late for even the later Fort Jackson re-occupation of the fort which would have a terminal date of about 1825. In South's measurement of Brunswick bricks of the small type we have a measurement of $7 \frac{1}{2} \times 3 \frac{1}{2} \times 1 \frac{1}{2}$ inches with a time span of 1730 to 1760.⁵ It may be that we are dealing with an as yet unrecorded brick type used by the French. In view of the Delft association with the ruin, I would be inclined to confine the ruin date to a date earlier than 1800.

Although there are no records reflecting the species and number of domestic animals at Toulouse at any specific date, it would seem almost certain that both pigs and cattle were kept for food purposes. A deserter to the English in 1755 stated that there were 140 women and children living in and about the fort.⁶ It is quite unlikely that these people lived exclusively on Indian fare. Further investigation in the fort site proper will certainly result in the recovery of bricks which can be used for comparative measurement.

In exposing the brick debris, approximately 36 square feet of overburden was removed as a lateral trench extension. Depth to bricks and other objects was from 10 to 12 inches from topsoil level, however, it was

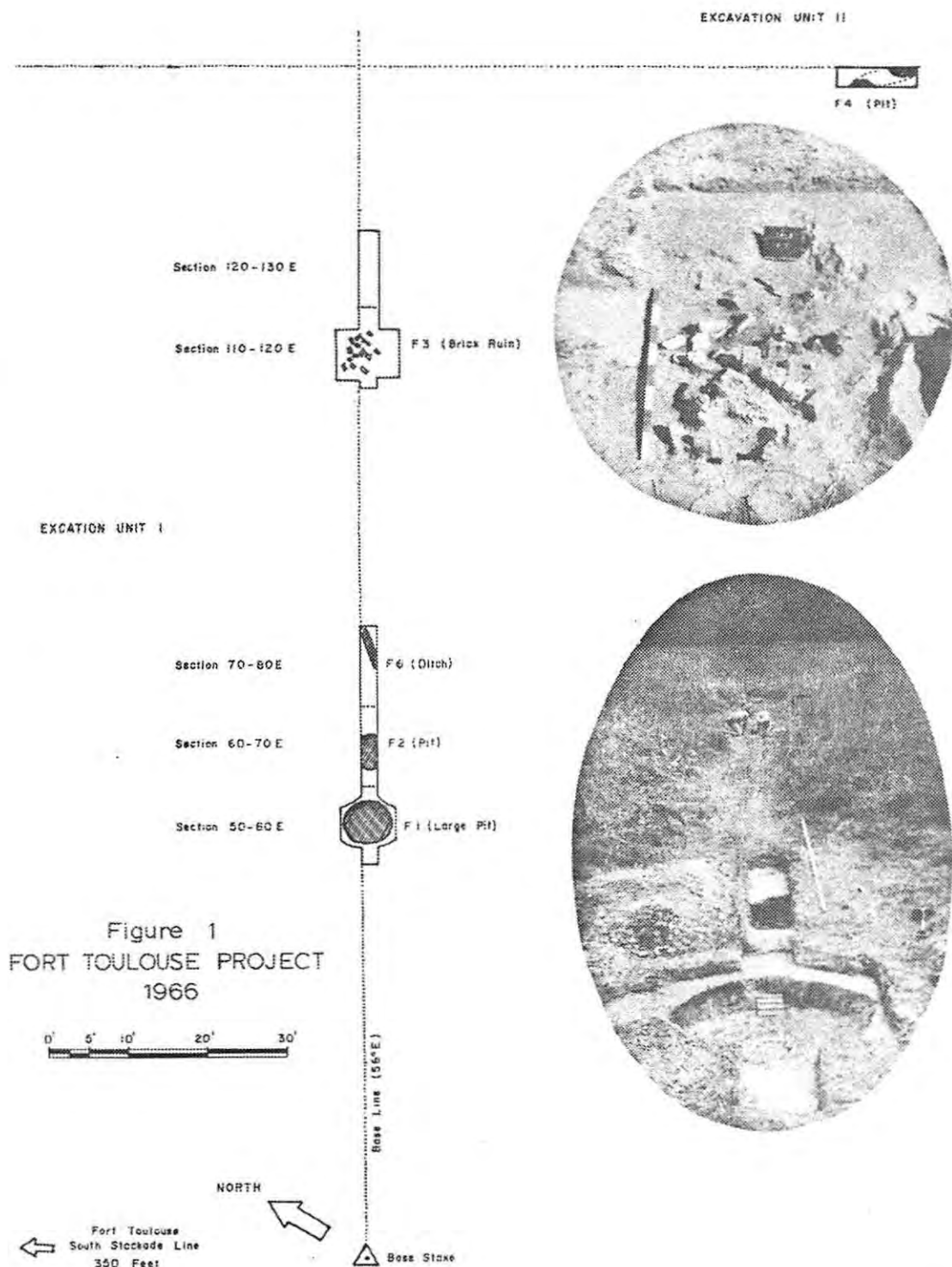
⁵ South, 1964.

⁶ Thomas, 1960.

obvious that many of the bricks had been disturbed by the plough. In 1963, when this site was visited by the writer for the first time, this field was under cultivation. Many objects were found in the plough zone to include bricks - usually concentrated in certain parts of the field as if these marked the locations of collapsed chimneys or house corner pillars. That was the last year that the field was cultivated since the state began acquisition proceedings in the following year.

Feature 4 (4 and 5 on field sketches, since Feature 4 and 5 had been ploughed through and at first appeared to be two separate pits.) This feature, an oblong pit occurred in a trench which was designated as Excavation Unit II. The top of this feature had no doubt been ploughed away since the undisturbed portion penetrated into the hardpan to a depth of only 3 inches at the deepest place. The fill consisted of grey and brown or burned clay and a certain amount of charcoal and wood ash. A great amount of what appeared to be foundry slag occurred in and over the pit together with artifacts of mainly Indian origin. Only 5 objects were found which could be classified as European. The nature of the Indian ceramics associated with this feature relate it to the late or historic village.

Feature 6 In Section 70-80E was located a rather curious ditch which crossed the section diagonally. Uniformly 8" wide and 15" deep, the feature contained only six objects of European make and 36 sherds of Indian pottery. It is possible that the feature could have been part of a building foundation, but there was nothing else found to substantiate this possibility. This ditch was discovered in the last day of the project and time did not permit further investigation of it.



Conclusion

It would appear likely that these limited investigations uncovered evidence pertaining to activities which took place during the time of French Fort Toulouse. An Indian village did lie to the south of the Fort during its occupancy. Thomas states: "Throughout its history, one Indian village appears to have been located just south of the fort. It was described as only a musket shot or 150 yards distant and was usually known to the French as Pacana or Pakana. About the same distance to the east was usually another, sometimes called Tomopa or Tomapa." ⁷

The nature and purpose of the brick structure uncovered in Feature 3 is not too clear. There are a number of possible explanations depending upon whether a fixed date can be obtained from the feature itself. Thomas repeatedly referred to civilians living near the fort and one instance has already been noted in this paper. . Thomas goes on to say: "A few French civilians who were Indian traders using the post as a base, might have been encountered within the stockade. For some years it is improbable that many, if any, settlers lived in the area. Civilians did eventually settle there, and soldiers were sometimes released from the service if they agreed to settle near their posts. By 1758, a census of the community showed over 160 inhabitants. There were two dozen families with children. The average number of children in these families was four, so, by the 1750's the sound of children playing must have been commonplace around the fort. Permission was granted for the members of the garrison to marry Indians in the hope that they might be less inclined to desert." ⁸

⁷ Thomas, p. 167.

⁸ Ibid.

Brannon in his Aboriginal Towns in Alabama⁹ cites Pakana as being "An Alibamo town, at different times in both Elmore and Montgomery Counties..." It must be noted that Fort Toulouse lay close to the eastern boundry of what could be considered Choctaw country for, as one proceeds westward from that area, Creek towns become less numerous and Choctaw towns more frequent, however, no specific delineation of boundries separating the two nations was ever firmly established. Since the Creeks and Choctaws were, for the most part, on friendly terms during the 18th Century, the location of one's town in the other's "territory" in border areas is not surprising.

As the writer was preparing to depart for the Middle East in mid-August of 1966, plans for further exploration of the Toulouse area had to be suspended. It was hoped that the site could be re-opened in the spring months of 1967, but more pressing survey and salvage work in the Jones Bluff Lock and Dam basin had to be attended to. Moreover, the unimproved dirt road which covers the 3 miles from U.S. Highway 231 to the Fort Toulouse public area was being hard-topped and for nearly three months of the summer practically impassible. Another factor at the present time involves the need for security in a site area which is also open to the public. If and when large scale explorations of the fort proper are begun, it will be imperative to maintain a guard at the site.

⁹ Brannon, 1920.

TABLE I
ARTIFACTS RECOVERED FROM SECTIONS (UPPER 8 INCHES OVER CLAY HARDPAN)

Section:	50-60E	60-70E	70-80E	110-120E	120-130E	Area II Trench
Ceramics:						
Chattahoochee Brushed	14	9	4	2		3
McKee Island Plain			1			
Childersburg Plain	167	117	67	32	3	28
Childersburg Incised	5	2		1		1
Kasita Red Filmed		2	1			2
Sand Tempered Plain	25	5	4	4	10	5
Daub	8					
Pipe fragment (Indian)	1					
Stone:						
Celt fragment			1			
Steatite bowl sherd	1					
Projectile pt. Elora Type				1		
Projectile pt. Swan Lake	1					
Chunky stone (disc)	2					
Bone:						
Animal refuse general			1	5	2	3
Pig (sus scrofa)						
Vegetable:						
Peach pit						
European origin:						
Staffordshire porcelain			1			
German Salt Glaze	1		1		1	1
Brown stoneware						
San Louis Polychrome						
Delft	1					
White faience	3	1			1	
Majolica	2					
Kaolin pipe stem	2					
Green bottle glass	15	7	3	4		
Light green glass	6		8			2
Clear glass	2	2				
Brick fragments	4			2	6	
Nail	5	3	2	1		
Keg hoop	1					2
Iron fragments	3	3	3		1	
Brass bracelet						1
Brass button						
Brass fragment			1			
Gunspall (blonde flint)			1			1

TABLE II
ARTIFACTS RECOVERED FROM FEATURES

	Fea. 1	Fea. 2	Fea. 3	Fea. 4*	Fea. 5	Fea. 6
Ceramics:						
Chattahoochee Brushed	211		1	6		9
McKee Is. Plain	3					
Childersburg Plain	10	3	2	3		26
Childersburg Incised	11					1
Kasita Red Filmed						
Sand Tempered Plain	8	5	1	1		
Grit Tempered Plain						
Daub	17			2		
Calloway Plain	10					
Stone:						
Ground greenstone frag.	1					
Game stone ("chunky")	1					
Stemmed Projectile pt.	1					
Bone:						
Animal refuse	59			2		
Pig (sus scrofa)	13		6			
Trade Items:						
Kaolin pipe frags.	5	1				1
Staffordshire china						2(?)
Salt Glaze ware	3					
San Luis Polychrome	1		1			
Delft	3		1	1		
White Faience	14					
Majolica	1					
Green bottle glass	5	4	1			3
Light green bottle glass	8					
Clear glass (bottle)						
Brick fragments			42	2		
Stoneware (see Salt glazed ware)						
Nail	24		1			
Keg hoop frag.	1		1			
Brass bracelet	1					
Brass button, plain	2					
Scrap brass	1					
Scrap iron	2	3	3			
Gunspall (blonde flint)	2					
Peachpits	2					

* Features 4 and 5 turned out to be one pit which had been plough damaged and made to appear at first as if there were two separate pits. Therefore, artifacts contained in both pits counted together and feature called Feature 4.

¹⁰ Chase, 1966.

REFERENCES

- Brannon, Peter A. Aboriginal Towns in Alabama, Handbook of the Alabama Anthropological Society, Montgomery, Alabama, 1920.
- Chase, David W. A Stratified Archaic Site in Lowndes County, Alabama, Florida Anthropologist, Vol. XIX, No. 2, Gainesville, Florida, June 1966.
- Corkran, David H. The Creek Frontier, 1540-1783, The University of Oklahoma Press, Norman, Oklahoma, 1967.
- Cotterill, R.S. The Southern Indians, The University of Oklahoma Press, Norman, Oklahoma, 1954.
- DeJarnette, David L., and Asael T. Hansen, Archeology of the Childersburg Site, Alabama, Notes in Anthropology, No. 6, The Florida State University, Tallahassee, Florida, 1960.
- Lazarus, William C., A Study of Dated Bricks in the Vicinity of Pensacola, Florida, The Florida Anthropologist, Vol. XVIII, No. 3, Part 2, Gainesville, Florida, 1965.
- Pickett, Albert James, History of Alabama and Incidentally Georgia and Mississippi From the Earliest Period, 2 Vol., Charleston, 1851.
- South, Stanley Some Notes on Bricks. The Florida Anthropologist, Vol. XVII, No. 2, Gainesville, Florida, June 1964.
- Thomas, Daniel H. Fort Toulouse, The French Outpost at the Alibamos on the Coosa, The Alabama Historical Quarterly, Vol. 22, No. 3, Alexander City, Alabama, 1960.

THE BRITISH REVOLUTIONARY FORTIFICATIONS
OF
CAMDEN, SOUTH CAROLINA

Alan Calmes

Camden District Heritage Foundation

Introduction

For several years interested citizens of Camden, South Carolina attempted to revive their town's role in the American Revolution into proper perspective alongside such developed sites as King's Mountain and Yorktown, but public agencies could see very little physical or documentary evidence to justify a study or restoration of the revolutionary period fortifications of Camden.¹ Finally, with the financial assistance of Mr. and Mrs. Richard W. Lloyd of Camden, a private foundation, the Camden District Heritage Foundation, is now undertaking large scale documentary research and archaeological excavations to produce the evidence to justify public attention.

The results of the first two months' work during September and October 1967, have revealed evidence of extensive earthworks and palisades once standing on presently undisturbed land immediately south of Camden.

Historical Outline

Shortly after South Carolina declared independence, Joseph Kershaw, a prosperous Camden merchant and revolutionist, directed the construction of a powder-magazine in Camden. In late spring 1780 the South Carolina revolutionists abandoned Camden and their powder-magazine. On June 1, 1780, Cornwallis took possession of the town. For the next year Camden was the

main supply point for all British campaigns in the South. All of Camden was the British "magazine," storing arms, ammunition, and provisions.²

Two very significant battles occurred just outside the walls of Camden: the Battle of Camden on August 16, 1780, when Cornwallis defeated Gates; and the Battle of Hobkirk Hill, April 25, 1781, when Greene and Rawdon fought to a draw, as the American forces made an orderly withdrawal and the British retired into the safe confines of Camden.³

The British evacuated Camden on May 9-10, 1781, to relieve the siege of Ninety-Six and a few months later found themselves trapped at Yorktown. When the British pulled out of Camden, Lord Rawdon destroyed the "works."⁴ Greene moved into Camden later and further devastated the fortifications so the British could not return and use them again.⁵

Documentary Evidence

1. In 1777 Joseph Kershaw presented a bill to the State of South Carolina for erecting a powder-magazine that consisted of 225,140 bricks.⁶
2. Kershaw protected the powder-magazine with an earthen barrier after May 24, 1780, for on that date he requested the plantation owners of that region to send slaves with "a spade for each" to the powder-magazine.⁷
3. A 1796 plat marks the Camden powder-magazine, measuring fifty by twenty-six feet, near the end of Market Street. (The same street plan and names are still used in Camden.)⁸
4. An entry in James Kershaw's Diary, July 28, 1794, contains this notice: "Set fire to ye Magazine [built] by Js. Kershaw, & began to move ye bricks."⁹

5. Cornwallis' chief engineer Col. James Moncrief reported in October, 1780: "I have ordered freemen and materials to be got ready for four or five redoubts with an 18 pounder cannonade in each."¹⁰
6. An American revolutionist spy saw the following features around Camden on December 5, 1780:

A detrenchment was thrown up around the Gaol with an abbatis, that another work & abbatis in the form of a half-moon was also thrown up near the road about a quarter of a mile to the East of the other, and a new work just beginning at the Lower End of the Town on the road towards the Ferry.¹¹

7. When Greene attempted to take Camden in April 1781, he found it too heavily fortified and so he did not attempt a siege.

The town is upon a plain covered on two sides by the River Wateree and Pine Tree Creek, and the other two sides by a chain of strong redoubts all nearly of the same size and independent of each other.¹²

8. Later, after the British evacuated Camden, Greene went into the town and sent the Continental Congress a plan of the British works at Camden, dated May 12, 1781. The map (Plate 1) shows the entire town enclosed by a log palisade wall. Six redoubts with abatis, one feature without an abatis and a couple of palisaded features stand off in isolation from the town. Unfortunately, the draftsman failed to place a compass direction or scale indicator on his map.¹³
9. A soldier's memoir of the Camden fortifications contains the statements that the stockaded town measured 400-500 yards square, that four redoubts stood off from the four points of the stockade some 200-300 yards and that the Gaol was fortified with a redoubt around it and stood in the middle of the north road in front of the main gate. He also said that Lord Rawdon's headquarters were in Joseph Kershaw's house which stood on a hill overlooking the town. ¹⁴

10. A 1774 map of Camden shows the location of the jail on the southeastern corner of Broad and King Streets. (The same street plan and names are still used in Camden.)¹⁵
11. Kershaw's house was on a little hill near Pine Tree Creek near the end of Lyttleton Street, east of the Revolutionary period town of Camden.¹⁶

Archaeological Evidence

A local historian, Millard Osborne, attempted a scientific investigation of the powder-magazine site in 1963-4, and discovered brick and earthen features. Aerial photographs (1938 and 1949) show a rectangular discoloration at the end of Market Street in Camden. Miss Elizabeth Ralph of the Applied Science Center for Archaeology, University Museum, University of Pennsylvania, carried out magnetometer and Geohm readings in the fields north of the end of Market Street in search of a British redoubt during August 1965. William E. Edwards and students of the University of South Carolina test trenched the low resistance regions but found no buried historic features. Edwards' 1965 summer excavations did cut through a portion of a brick rubble pile and earthen ditch, however, at the end of Market Street.

Since September 1, 1967, excavations have exposed the powder-magazine foundation ditches measuring fifty by twenty-six feet filled with brick debris. Modern disturbances greatly added to the elimination of practically all of the physical remains of the powder-magazine. For a hundred years residents of Camden systematically removed the bricks from the site to build an arsenal and houses. Consequently, the archaeologist exposed

THE BRITISH REVOLUTIONARY FORTIFICATIONS
OF
CAMDEN, SOUTH CAROLINA

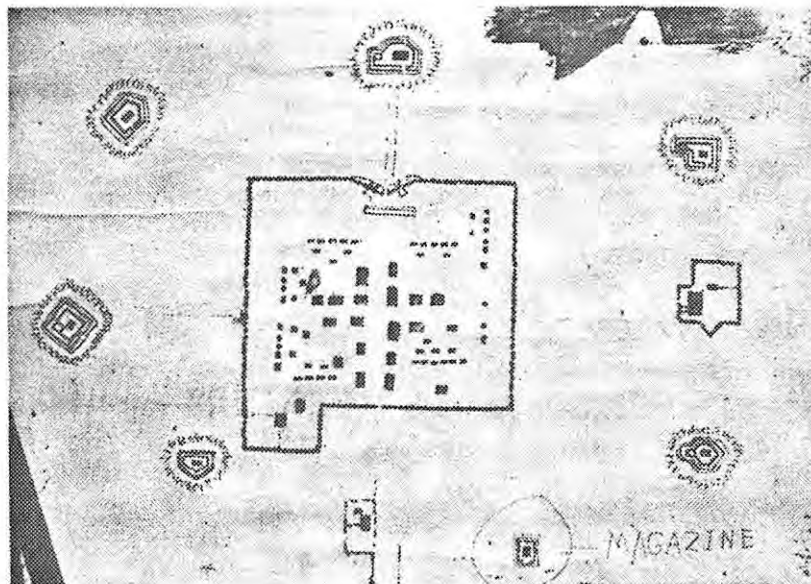


Plate 1
1761 PLAN OF CAMDEN



Plate 2
EXCAVATION OF THE POWDER MAGAZINE

- A. Location of Cannon Ball found in site near center of building
- B. Large pile of fallen bricks
- C. Building foundation ditch filled with brick rubble

original foundation ditches filled with brick rubble rather than whole bricks in rows. Very few areas of the site went undisturbed. Modern glass, wire nails and tin cans are as deep in many spots as the bottom of the foundation ditches.

The rubble, however, preserves a clear outline of the building showing all four walls, center supports and four buttresses along each of the two long sides of the building (possibly to support a brick vaulted ceiling). (Plate 2). The building was lengthwise, almost directly north-south.

A crew of four men removed the plow disturbed late layers of earth in an area southeast of the building where Millard Osborne found an earthen feature. A distinctly regular dark streak eight feet wide appeared and marked the location and shape of a ditch. The southeastern corner of the fort ditch was directly diagonal to the powder-magazine structure's southeast corner, so a definite relationship existed between the building and the ditch. More important still is the fact that the ditch formed a perfect right angle at that corner. This gave the researcher sufficient information to determine which feature represented the powder-magazine on the 1781 plan of Camden.

The excavators screened out very few revolutionary period artifacts from the dirt and debris. Several grapeshot, musket balls, pipestems, and cannon balls, however, sufficiently identify the site with the powder-magazine. Furthermore, a six inch layer of black gunpowder lined the bottom of about forty feet of the ditch (the black material burns with a sulfur smell).

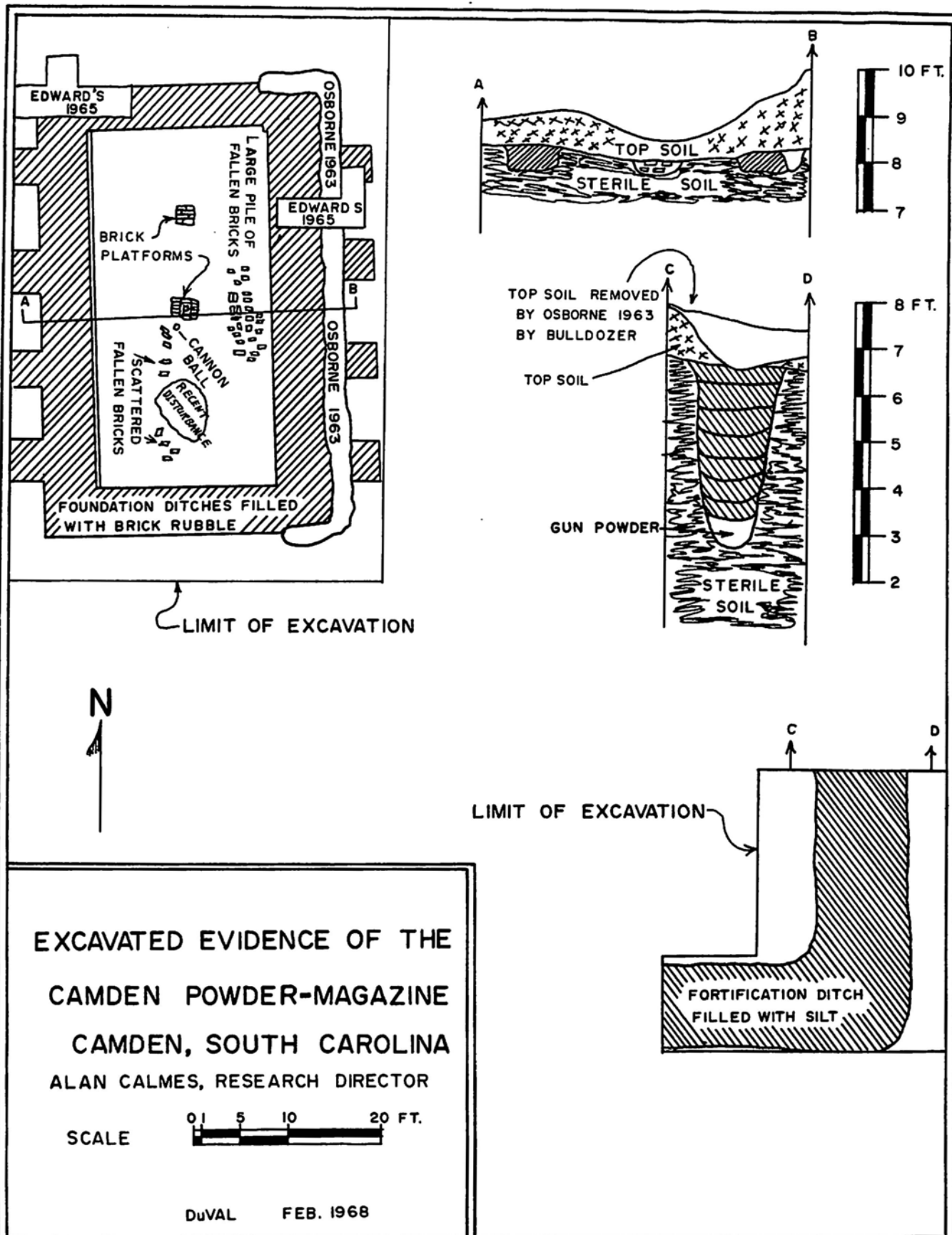
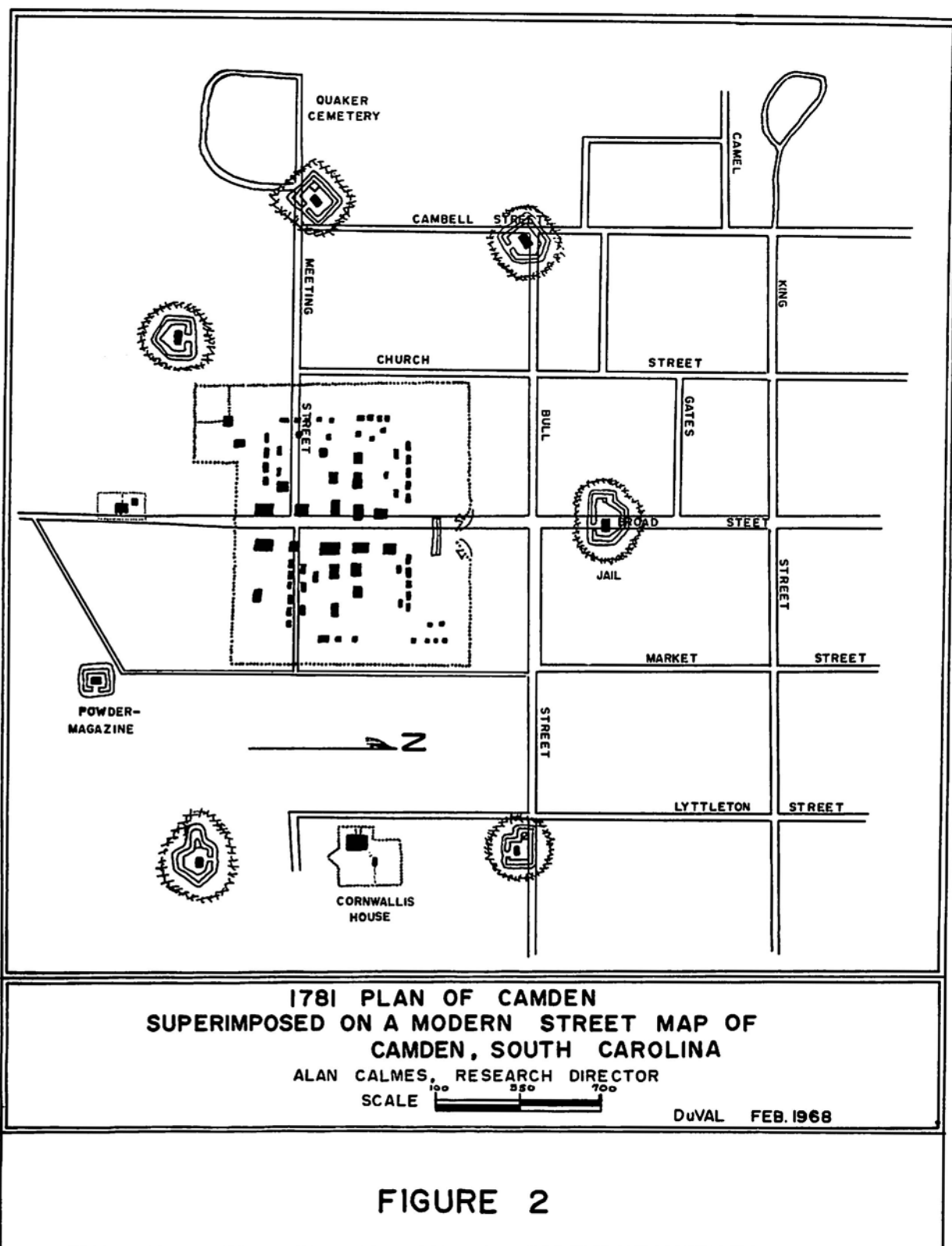


FIGURE I

Conclusion

1. By coordinating the 1781 map of the fortified works of Camden with the accounts that the British threw up earthworks and an abatis around the jail, blocking the north road leading into the main gate of the palisaded town and that a half moon shaped redoubt stood east of the jail, the compass direction and figure of the jail can easily be located on the 1781 map (Plate 1, top center).
2. The small palisaded feature shown to the right of the large central palisaded town in Plate 1 most likely designating the British headquarters is properly located on a hill overlooking the town at the traditional site of Kershaw's house.
3. After aligning the map north-south and searching for a feature with a right-angle in its southeastern corner, the powder-magazine turns out to be the rectangular building and earthworks shown just right of the bottom center of the map in Plate 1 without an abatis around it. It is the only feature with a building aligned lengthwise north-south and has a symmetrically arranged ditch surrounding it, forming a right angle at its southeastern corner.
4. With two known points definitely located on the ground and on the 1781 map, the jail and the powder-magazine, the map can be scaled. By re-examining the aerial photographs with the map scaled down and placed over them, properly shaped discolorations appear at several redoubt positions.



5. The size of the overall fortifications of Camden were quite large.

The British Magazine of Camden dominated the entire colonial town with a log palisade wall surrounding it. Large earthen redoubts, each with a structure or two in the center, stood off from the town. In addition, to these, the works also consisted of a fortified jail, two separate palisaded features (one of which is probably Kershaw's house and the British headquarters), and finally the site presently being excavated, the brick powder-magazine surrounded by a rectangular ditch and earthen wall built before the British occupied Camden.

6. Luckily, most of the land covering the British fortifications remains in fairly good condition with few modern structures. The Camden District Heritage Foundation hopes to secure state and federal interest in the project so that all the features may be studied and preserved.

NOTES

¹ Sarles and Shedd 1964: 160-161. Note the omission of Camden from the National Park Service's register of colonial and revolutionary sites. Only the battle site of the Battle of Camden, north of town, is on the list.

² Tarleton 1787: 88. "The magazine was formed at that place on account of the convenience of water carriage by the river from Nelson's ferry, and because it was the most eligible position to support the communications between the army and Charlestown, when the King's troops moved forward into North Carolina."

³ Peckham 1958: 138, 146-7, 160-1; Kirkland and Kennedy, I, 1905: 142-273.

⁴ Rawdon to Cornwallis, Monck's Corner, May 24, 1781, reference code 30: 11: 66, Cornwallis Papers.

⁵ Greene to Continental Congress, Camden, May 14, 1781, Item 155, Vol. II, p. 59, Greene Letters.

⁶ Kirkland and Kennedy I 1905: 130.

⁷ Kershaw's Orders for Slaves, Camden, May 24, 1780, Gibbes Collection.

⁸ Kirkland and Kennedy I 1905: 130.

⁹ Ibid., 406

¹⁰ Moncrief to Cornwallis, Camden, Oct. 1, 1780, reference code 30: 11: 64, Cornwallis Papers. Note: Moncrief's accounts covering Camden and the time 1780 and 1781 are available in the British Public Record office. Andrews II 1912: 69, 105.

¹¹ Harrington to Gates, Camp near Kershaw's Ferry, November 5, 1780, Item 154, Vol. II, pp. 319-320, Gates Letters.

¹² Greene to Continental Congress, Camden, April 22, 1781, Item 155, Vol. II, pp. 41-42, Greene Letters.

¹³ Plan of Camden, May 12, 1781, Item 155, Vol. II, p. 161, Greene Letters.

¹⁴ Mathis to Davie, Camden, 1819.

¹⁵ Kirkland and Kennedy I 1905: 12-13.

¹⁶ Ibid., 274.

REFERENCES

- Andrews, Charles M.
1912-14 Guide to the Materials for American History, to 1783, in the Public Record Office of Great Britain. 2 vols. Washington: Carnegie Institute of Washington.
- Cornwallis Papers
n.d. On microfilm in the South Carolina Archives, Columbia.
- Gates Letters
n.d. Papers of the Continental Congress, 1774-1789, Roll 174, Item 154, 2 vols. Washington D.C.: The National Archives and Records Service, General Services Administration, South Carolina Archives, Columbia, microfilms.
- Gibbes Collection
n.d. MSS. in the South Caroliniana Library, University of South Carolina, Columbia.
- Greene Letters
n.d. Papers of the Continental Congress, 1774-1789, Roll 175, Item 155, 2 vols. Washington, D.C.: The National Archives and Records Service, General Services Administration. South Carolina Archives, Columbia, microfilms.
- Kirkland, James J. and Robert M. Kennedy
1905-26 Historic Camden. 2 vols.; Columbia, South Carolina: The State Printing Company.
- Mathis, Samuel to General Davis
1946 Battle of Hobkirk Hill. Cleveland, Ohio: Facsimilie printing of 1819 letter by R.C. and L.H. Norton.
- Peckham, Howard H.
1958 The War for Independence, A Military History. Chicago: University of Chicago Press.
- Sarles, Frank B., Jr. and Charles E. Shedd
1964 Colonials and Patriots, Historic Places Commemorating our Forebears, 1700-1783. Vol. VI of The National Survey of Historic Sites and Buildings. Washington: U.S. Government Printing Office.
- Tarleton, Lieutenant-Colonel
1787 A History of the Campaigns of 1780 and 1781, in the Southern Provinces of North America. London: Printed for T. Cadell in the Strand.

ARCHAEOLOGICAL EVIDENCE OF POTTERY REPAIRING

Stanley South
N.C. Dept. of Archives and History

Since pottery fragments are of primary interest to the archaeologist in establishing temporal relationships, he frequently finds himself involved in statistical treatment of the sherds he recovers. Whenever possible he glues the fragments together to determine the form of the vessels. Through restoring to its original form a clay pot made perhaps by an Indian woman a thousand years ago, he sometimes finds drilled holes on each side of a crack that had apparently occurred before the vessel was completely broken and discarded. These holes have been interpreted as patching holes, through which a thong of sinue was passed, allowing the vessel to continue to be used, perhaps for storage of dry materials. Such holes reveal that the archaeologist was not the first to repair that particular vessel.

Archaeologists have found clay vessels representing numerous components, covering thousands of years in time, that were once repaired by drilling holes on each side of a crack. From this fact the question arises as to how long this practice of repairing pots has been used among North American Indian groups. The answer would be in terms of several thousand years, at least. Evidence for this is seen in steatite vessels from the Archaic Period having drilled repair holes similar to those found on the later clay vessels. One such vessel is on exhibit in the Natural History Museum at the Smithsonian Institution. From this we might say that the Indians have been repairing pots, by drilling holes, perhaps almost as long as they have had pots. Wooden bowls, of course, could easily be repaired in the same

manner, and a long history of repairing of wooden vessels may have existed among Indian cultures, evidence for which we do not have.

The historic site archaeologist might be brought to an awareness of the mending of vessels by drilling of holes on each side of the break, by finding fragments of mended porcelain, or possibly delft or faience, on the site he is excavating. In the ruin of the eighteenth century Hepburn-Reonalds House ruin in Brunswick Town, North Carolina a fragment of an Oriental porcelain bowl rim was recovered, having a brass plate through which two copper rivets were fastened through holes on each side of a crack. The brass plate measured three-quarters of an inch long and three sixteenths of an inch wide, with the rivets one-half inch apart. On the inside a small cone-shaped copper washer had been fastened over each of the rivets and then the rivet was hammered over the washer to provide a tight fit. If the crack was a long one, a number of such rivets would, no doubt, have been used. While the exterior of the vessel so mended would have a fairly attractive appearance due to the smooth brass backing plate, the interior was somewhat unsightly due to the presence of the two rivet heads with attached cone-washers, plus the fact that when the hole was drilled entirely through the steel-hard porcelain, conchoidal fractures occurred around the holes on the inside of the vessel. Nevertheless, the bowl was patched, and further service was obtained from the vessel by the owner due to this repair.

At "Russellborough", the home of the royal governors at Brunswick Town from 1758 to 1770, an overglazed enamelled porcelain handleless teacup was recovered that had been repaired with no less than ten drilled holes. The heat of the fire that destroyed the building in 1776 was such that the rivets had been melted from the holes, and no indication of what they had been was found. The holes were again characterized by the typical conchoidal fractures

around the opening, caused by the process of drilling the very hard porcelain.

At the eighteenth century site of the Fortress of Louisbourg, Nova Scotia, archaeologists have recovered a number of examples of mended vessels. John Dunton reports that these were French coarsewares and faience, and all were of the simple wired type, with holes drilled on each side of the break through which iron, brass or lead wires were inserted and then twisted to tighten,¹ a simple method, reminiscent of that used by the American Indians using sinue.

From the archaeological evidence seen here it is clear that patching of broken vessels was practiced on eighteenth century ceramics. From an advertisement in the Pennsylvania Chronicle of April 20, 1767, placed by Daniel King a brass-founder and brand-maker we find that besides his brass wares he advertised that "He also rivets broken China, in the neatest Manner."² This indicates that brass-founders were the craftsmen that were, sometimes at least, making these ceramic repairs. Tinsmiths and tinkers also likely turned their talents to this endeavor as the occasion demanded.

Something of the history of china mending is revealed by Parsons and Curl in their book China Mending and Restoration. They say:

¹ John Dunton, personal communication.

² Pennsylvania Chronicle, April 20, 1767.

China in daily use comes in for the severest tests and hard use.

Riveting has long been the traditional method of mending it, which is the science of holding broken pieces together without adhesives. It is an ancient craft; a form of riveting was practiced in China as early as the seventeenth century. It took Europe by storm in the nineteenth century when it became so popular that riveters paraded and embellished rather than disguised their rivets. Later craftsmen learnt to do work that was both efficient and discreet, but it is the samples of clumsy, ill-proportioned riveting that have formed prejudice against the craft, and recent scientific development in adhesives has led³ many people to believe that riveting is now obsolete.

The craft of repairing by riveting is not obsolete, as these authors point out. Since period china is irreplaceable, it becomes more and more important that necessary repairs on frequently used pieces be done with the greatest professional care. Riveting is ideally suited for wares that must come into daily contact with steam and detergents, since no adhesive is used. All adhesives have a limited life, whereas the riveted repair will last as long as the vessel. Since riveting was practiced both in the eighteenth century on vessels of the period, and by nineteenth century and twentieth century riveters, it is important that museums that utilize the services of riveters make a record of when the repairs were carried out and by whom, so that there will not be a confusion as to when the repairs were carried out. This writer has found examples of repaired eighteenth century vessels in museums where no record of the repair existed except in the memory of the curator who recalled that some years ago a man was employed to do this type work. No one had thought to record that it was done or by whom, and from the appearance of the riveted repair, it might well have been done in the eighteenth century.

³ C.S.M. Parsons, and F.H. Curl, China Mending and Restoration. (London: n.d.), p. 20.

Parsons and Curl reveal all the most minute details of the riveters craft, pointing out that the work of repairing a broken vessel must be done in the lap, and that in this regard females might have more difficulty than males since a bosom is no asset at all, the worker needing "a clear and unobstructed view of what is going on in the lap."⁴ Once the worker has an unobstructed view of his lap, he uses a Chinese string drill, operated by the fingers of one hand, to bore holes into the surface of the porcelain, producing a flat bottomed hole with sides at a fifteen degree angle away from the cracked edge. The drill bit is a small chip of diamond fitted into the end of a spindle. With less than one hundred strokes of the Chinese string drill a hole sufficiently deep to accommodate a rivet can be made in porcelain. The rivet looks like a modern staple, though thicker, and with short arms. It is made from half-round brass wire by shaping with pliers. The short arms are cut so as to fit snugly into the holes on opposite sides of the crack in the vessel. The arms of the rivet are bent slightly inward. One arm of the rivet is then placed into one of the drilled holes, and through pressure applied to the back of the rivet the other arm is snapped into the second hole. Thus, under pressure, the rivet always exerts an inward pull on each piece of the vessel, and when a sufficient number of these rivets are in place the vessel is repaired in the strongest manner, and will withstand the usual handling and exposure to steam and detergents without leaking or coming apart.⁵

⁴ Ibid., p. 30.

⁵ Ibid., pp. 35-44.

The advantage of this method of riveting as opposed to those specimens from Brunswick Town and Fortress of Louisbourg where the hole was drilled entirely through the wall of the vessel, is the fact that here the interior of the vessel is left entirely free of any blemish caused by rivet heads or by twisted wires. An elaboration of this riveting method reported by one who was a resident of China for many years is used by craftsmen there in repairing porcelain vessels, allowing no rivet to be seen on either side of the repaired vessel. This method is the same as described above by Parsons and Curl for drilling the holes and inserting the rivet, but with the added feature of both holes being connected by a slot. The rivet is then inserted into the holes, but instead of lying on the exterior face of the vessel, it is countersunk below the surface in the slot. The porcelain dust is carefully saved during the drilling operation and mixed with an adhesive, and this mixture is used to fill over the rivet, providing not only a very strong repair, but allowing the rivets to become invisible.⁶ This improvement, practiced in China a few decades ago, and probably still in use there today, would seem to be the ultimate development in the technique of repairing vessels by means of drilling holes on each side of the break, a technique used by man for thousands of years in his efforts to salvage for further use an accidentally broken vessel.

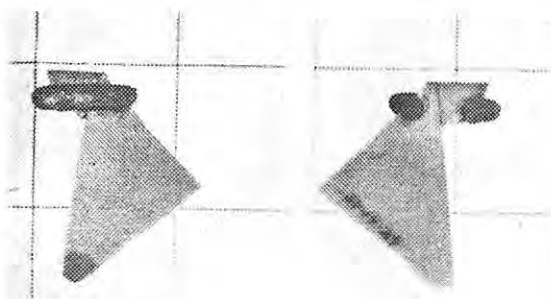
6

Mrs. Frank Albright, Old Salem, North Carolina, personal communication.

Repaired Ceramics

from Eighteenth Century Sites

S. South 10-67



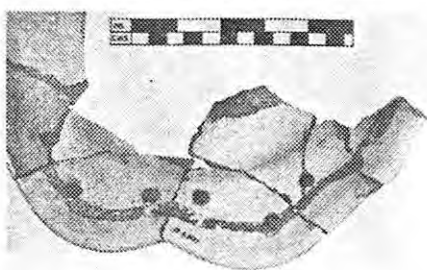
Exterior

Interior

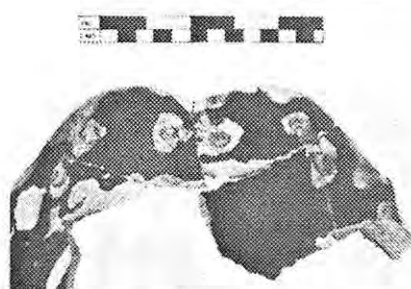
Oriental Porcelain from Brunswick Town,
North Carolina



Over-glaze Enameled Porcelain from
Brunswick Town

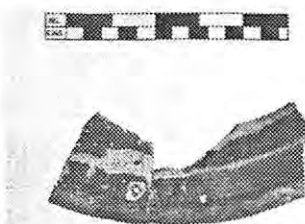


Interior



Exterior

Faience from Fortress Louisbourg, Nova Scotia



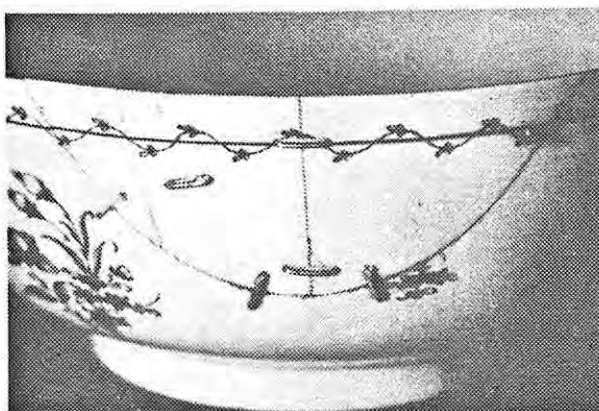
Lead-glazed Earthenware from
Fortress Louisbourg



Faience from Fortress Louisbourg



Scratch-blue Salt-glazed Stoneware,
Over-glaze Enameled Porcelain, and
Oriental Porcelain Repaired Between
1755 and 1771 by Gottfried Aust at
Bethabara, N.C. Using a Green Glaze.



Over-glaze Enameled Porcelain Bowl at the
Smithsonian Institution with Twentieth Century
Rivet Repair.

The archaeologist uses glue to restore to its original form the Indian pot whose owner effected his own repairs by means of drilling holes. This use of glue by the archaeologist points out the two basic methods of repairing pottery, riveting and "sticking" or glueing. We have discussed the riveting technique as seen through a few artifacts recovered from archaeological sites, and would now like to mention the second technique, glueing. The archaeologist is familiar with this method, and many have had to re-glue vessels that have originally been repaired with an acetone solvent glue after it fell apart in his hands, having been in storage for some time. This paper is not designed to enter into all the aspects of pottery glueing, but will simply point out some observations, and two examples of eighteenth century glueing archaeologically recovered.

Acetone solvent glues form a hard film which is effective for glueing together many objects. However, earthenware is highly susceptible to changes in moisture in the air, and when the weather is damp it takes on moisture, when it is dry it gives off moisture. This "breathing" effect, of moisture passing in and out of fired earthenware, affects the glued joints of vessels restored with acetone solvent glues. In dry weather the moisture passes from the earthenware sherd into the air, and where there is a glue joint, it abuts against the hard film of waterproof glue. In so doing the hard film of glue is gradually loosened from its bond with the earthenware, and when such a vessel collapses, the glue joints can be easily pulled away from the sherds as a hard transparent film. This situation is familiar to archaeologists who have had this happen, and is most disconcerting. In air conditioned buildings the problem is not so great, but in areas where the humidity is high, this can become a significant problem. What is the answer? Suppose that a water-soluble glue was used, then

when moisture was taken into the earthenware or given off, it would similarly affect the glue joints, allowing for expansion and contraction of these at the same rate as that in the earthenware. Therefore, there is no separation between the glue joint and the earthenware sherds due to differential expansion and contraction as well as differential rates of moisture absorption. The result is that such a glue does not release its bond after prolonged storage under high humidity conditions as does glue with an acetone solvent base. Therefore, white glue such as Elmers or Weldwood has proved to be an excellent bonding agent for large earthenware vessels. It becomes tacky very quickly, and therefore will allow almost continuous restoration on large vessels such as amphora or large oil storage jars. It is highly recommended for this type glueing. On stonewares, however, where there is no absorbancy of the sherds of the moisture in the glue, it is not quite so satisfactory. Once set, however, it again is much superior in holding power to those vessels bonded with acetone solvent glues.

At Brunswick Town, in the ruin of the Public House-Tailor Shop, burned in 1776, a fragment of Oriental porcelain had a film of what appeared to be glue along some of the edges, providing evidence that the piece had possibly been repaired by this method.

Another interesting use of the glueing technique in the eighteenth century is to repair broken Oriental porcelain and white salt-glazed stoneware vessels was recovered during excavation of the pottery shop ruin and other ruins at Bethabara, North Carolina, an eighteenth century

Moravian settlement. The potter Gottfried Aust was found to be using a green glaze on broken porcelain and stoneware vessels, which, when fired, would produce a green joint along the original break, but resulted in an effective repair of the vessel.

Parsons and Curl report that:

Recent research in synthetic-resin preparations — adhesives, compositions, glazes — has lifted china mending to new levels of efficiency...⁷

It is interesting to note that Gottfried Aust had conducted his own research between 1755 and 1771 at Bethabara, and found that he could use glazes to effect successful repairs, and thus raise his own china mending to a new level of efficiency. One wonders if this was an innovation of Aust's, or if this was a common practice of potters of the day. If archaeologists will look for and report on Oriental porcelain and European stonewares with glaze along the edges of fragments found in their excavations, eventually we may be able to learn whether this technique of pottery repairing was an innovation of the master potter Aust, or was rooted in a broader base among eighteenth century potters in America.

MACHINE MADE NAILS FROM A WAR OF 1812 SITE AT
SACKETS HARBOR, NEW YORK

Edward McM. Larrabee

Nails are neglected artifacts. They are frequently numerous on an historic site, and present a quandry to the archaeologist. He knows that the nails could yield useful information, but he is confronted with a pile of small lengths of iron, variously bent, broken, and twisted, covered with an encrustation of rust and adhering soil often thick enough to completely distort their original shape, and he does not have the time or money to have each nail carefully cleaned, keeping important evidence, and catalogued by experts who know nails, especially old ones. How can he economically extract useful information, and what can he expect to find?

It is to that problem that I applied myself during the summer of 1967 because I was working on a site where nails seemed important (they were the only structural evidence in one area) and possibly a particularly sensitive tool of analysis, because the technology of nail manufacture was changing rapidly during the period that the site was occupied. This paper is only a beginning, however, and suggests a few answers to parts of the problem. I hope I can follow it with further information.

Sackets Harbor, New York, is at the eastern end of Lake Ontario. It was the major naval and military base for U.S. operations on the lake and downstream on the St. Lawrence during the War of 1812. There were many thousands of men stationed there between late 1812 and early 1815, and

there was much construction, of shelter, vessels, and fortifications. The town was a small village founded only a short time before the war. It has remained a village ever since. A small part of the barracks and fortifications were not built over for later purposes, and here we excavated in the summer of 1967 for the Thousand Islands State Park Commission, of the State of New York. We dug in three related areas, but I will discuss here only one of them, Fort Kentucky. I chose it because there was a smaller and more manageable sample than in the other two areas, because nails could yield relatively more information here, and because analysis of this site was the most advanced.

Fort Kentucky was an earthwork erected sometime after May, 1813, and before 1814, guarding the approach to the town from the southwest, along the top of the cliff above the lake shore. It was part of a ring of earthworks and block-houses connected by a line of log breastwork and abatis. The "fort" was more properly a redoubt, with two faces and flanks, but open at the rear, except for a picket or palisade line. It was perhaps 150 feet long and 100 feet wide. There is no evidence that the site was used for anything except farming after 1815.

This site was excavated by Susan Kardas, one of the three members of the archaeological staff.¹ She ran a series of test trenches across the

¹ I am indebted to her for preparing the material for this study. Also, I must thank Alan Brew and Harvey Crew, the other archaeologists under my direction, for their work and suggestions concerning nail analysis.

presumed line of the ramparts of the work, both with manual labor and then with back-hoe.² Where artifacts appeared in the plow zone of the shallow soil (about 18 to 20 inches to the limestone bedrock except where disturbed), she extended to the side in pits, and screened the back-dirt of the machine trenches, where profitable. Somewhat over 1,400 artifacts were found, and about 600 of these were nails. With the exception of a few scattered objects, and a few modern nails along a 20th century fence line, the artifacts, including the nails were concentrated in a very small area. Over 88% of all objects came from only 14% of the area investigated at Fort Kentucky, so that this small unit had an artifact density nearly fifty times as great as the rest of the site.

This concentration seemed to indicate a light structure, where plowing had disturbed what other evidence there may have been. Since a few historical references said that there had been "a blockhouse" in Fort Kentucky, but did not place it nor describe it, the nails were potentially our major source of information about this — if indeed it was a blockhouse.

We undertook to study this collection of nails, using the available literature. There are about half a dozen articles, leaflets, or chapters describing nails for the use of an archaeologist.³ I found that these

² Susan Kardas, "Excavations at Fort Kentucky, Sackets Harbor, 1967: A Preliminary Sketch", Bulletin of the Jefferson County Historical Society, Vol. 9, No. 1, (January, 1968) pp. 9-14.

³ Henry C. Mercer, "The Dating of Old Houses", Papers of the Bucks County Historical Society, Vol. 5, pp. 536-49, (1923) /also separately printed, pp. 1-28, and also appearing in Old Time New England, Vol. 14, No. 4, (1924), where it is cited in Fontana et al., 1962/

———, Ancient Carpenters' Tools, The Bucks County Historical Society, Doylestown, Pa., 1929 (2nd ed., unchanged, 1950), 339 pp. (especially pp. 235-44)

Lee H. Nelson, "Eighteenth Century Framing Devices With Special

writings and their accompanying illustrations did not provide all the information we needed to make a meaningful analysis of the nails, and so have tried to supply some more information, and to make it more pertinent to the problem I mentioned at the beginning -- how to extract useful data from a mass of corroded nails.

Emphasis on Early Cut-Nails", National Park Service, Eastern Office of Design and Construction, Philadelphia, Historic Structures Training Conference, 28 July, 1961, 6 pp. mimeographed leaflet, with 1 plate

-----, "Nail Chronology as an Aid to Dating Old Buildings", American Association for State and Local History Technical Leaflet 15, History News, Vol. 19, No. 2, December, 1963, 3 pp. with 1 plate.

[apparently an earlier version of the latter exists as a 6 pp. mimeographed leaflet issued by the E.O.D.C., N.P.S., in 1962, because it is cited as such in Fontana, 1965]

Bernard L. Fontana, and J. Cameron Greenleaf, with the collaboration of Charles W. Ferguson, Robert A. Wright, and Doris Frederick, "Johnny Ward's Ranch: A Study in Historic Archaeology", The Kiva, Vol. 28, No. 1-2, October-December, 1962, 115 pp. (especially pp. 44-66)

Bernard Fontana, "The Tale of a Nail: on the Ethnological Interpretation of Historic Artifacts", The Florida Anthropologist, Vol. XVIII, No. 3, Part 2, 1965, pp. 85-101

[Also there should be cited, for correction, an error laden anonymous news story entitled:

"1819 Company Produces Cut Nails", in Preservation News, July, 1967, p. 6]

First I outlined the problem under the headings of: potential information; means of obtaining it; practical limitations; and possible improvements.

I. Information Which Could, in Theory, be Obtained from Nails.

A. Structural

1. Existence and location of a building (by general distribution of nails)
2. Characteristics of a building (by types of nails, specific concentrations, etc.)
3. Length and intensity of use (by showing modifications, additions or alterations at later date).
4. Fate of the building (by showing fire-temper, or nails pulled out, or nails apparently left in wood which rotted, etc.)

B. Dating

Nails may date a specific building, but also will serve to date the use of the site in general.

C. Trade Connections

If it is possible to find the manufacture, or material source for nails, this may yield other information about the people who came to the site.

D. Building Practices

The use or misuse of nails, their scarcity or abundance, etc., can tell about the craftsmanship of the building.

II. Means by Which This Information Could be Obtained

A. Material Analysis

(Although the way nails were made, especially by hand, means that a bar or rod of iron produced at a mill or bloomery somewhere could travel far or wait long before being made into nails.)

B. Manufacture Technique

1. Handmade (so far, few things are known which allow us to make significant differentiation among hand made nails.)

2. Part hand-part machine made (as always, when some technique is changing it is easier to make fine distinctions)

3. Machine made (the following categories can be subdivided extensively.)

a. cut

b. cast

c. wire

C. Identification of Intended Function

(i.e., a "finishing" nail, a "shingle" nail, etc.)

D. Evidence of Actual Function (including re-use)

(e.g. - a set of nails in half of a hinge, all clinched at the same length, suggesting that this part of the hinge was on the moving part of the door, and giving the thickness of the plank.)

E. Locating Nails, To Plot Their Distribution

III. Practical Limitations on Obtaining this Information

A. Condition of the Nails

1. Directly man-caused:

The very hammering, clenching, breaking, "be-heading," etc., which can tell about use, can obscure identification.

2. Indirectly man-caused:

The corrosion, fire-temper, etc., which also tell us of the vicissitudes of the nail, make it almost impossible to "read". They are difficult to clean and, if "mass" cleaning techniques are used, the very evidence of their history may be lost.

B. Conditions of Finding

1. Quantity:

When present, nails are often found in dismayingly large numbers.

2. Size:

Although not as small as beads, nails are small, and among the artifacts more easily lost. They are difficult to catalogue individually.

3. Lack of Care:

Because of A & B above, nails are rarely excavated and located with proper care. They are usually bagged with material from a general area. Often they are not even that well separated, but are lumped in gross, and a passing mention is made.

IV. Possible Improvements Which Would Reduce the Limitations

A. Condition of the Nails:

Ideally we need a simple, economical means of cleaning masses of nails, without destroying valuable evidence, or losing track of each particular nail, if individual numbers are important.

For this I have no panacea, but a tentative suggestion that some form of sand-blasting may be the answer. I hope to report more on that later.

B. Conditions of Finding:

No artifact will yield more information than is made possible by the care with which it is excavated. If you want to get the most from your nails, record their location as you go, as carefully as with any other object.

C. Material Analysis:

I suspect that detailed study of the stress in nails, by etched photo-micrographs, may tell us a good deal. Eventually I hope to report on material analysis of this collection.

D. Manufacture Technique:

Here most attention has been focused so far, and it was in the fine points of this that I found the worst problems with using the literature. This is the subject of the latter part of this paper.

E. Intended Function:

This is closely related to identifying other aspects of a nail. This too I hope to treat later.

F. Actual Function:

The same detailed study which can say something about materials, stress and configuration should record evidence of how the nail was used. The problem is one of establishing convenient ways of detecting, and recording, 'use evidence.'

The major problem I found in trying to use the literature to identify this collection of nails, prior to analysis, was that the criteria for differentiating different manufacturing types of early cut nails could not be used conveniently. The criteria depend on what direction the "burr and shear", take on the sides of the nail, how the "grain" of the metal runs, and what technique of heading was used, after the shank had been cut. Corrosion often obscures the "burr and shear", or has destroyed it. The grain is usually completely hidden, and often the head has been more exposed and has rusted away, or at least into unrecognizability.

Add to this the fact that the literature describes most of this verbally, and that there are serious discrepancies between some of the sources as to what the variation of "burr and shear" mean, and how they should be dated. The illustrations in this literature are line drawings, and are not sufficiently detailed to allow one to identify a particular excavated nail with safety. Particularly, they are not such that one can leave the identification of nail types to any but the most experienced people—that is, the archaeologists, who have many other things to do beside minutely inspect hundreds or thousands of nails.

Most archaeology has a "corpus" of well described, measured, and illustrated artifacts. Furthermore, those which become "type-specimens" must have clear provenience. This is not true of nails (and a number of other items) in historic site archaeology. Having seen the difficulty of using the available sources, and of analyzing nails, and having felt the need for a body of well described nails, illustrated in such a way that other people could compare their finds, I decided to start with our collection, to break it down into visual types, and to illustrate and describe each of these types so that comparisons could be made. Only in this

way can trustworthy archaeological information be accumulated.

This is not intended to criticize the importance of any previous studies, nor to imply that trade journals, technical encyclopedias, and catalogues, or clues resulting from manufacturing techniques, are not useful. However, before trying to interpret our findings in terms of these, we need an illustrated list of "holotypes" — of specific nails found under specific conditions, associated with particular date brackets. This is what I hope to start.

Part 2

Following are a few of the types found that are completely or partly machine made nails. The drawings should be clear enough so that even a fragmentary, or partly obscured nail, can be identified by comparison. We found, while sorting the nails, that many of them fell into recognizable groups within which the characteristics of shape, regardless of size, formed a distinct "gestalt". This can be used to identify nails, even when the particular manufacturing criteria are obscured.

We used simple terms, descriptive of the appearance of the nails, in order to avoid biased names which implied knowledge of either relative dating or specific manufacture techniques. Later, I hope to relate the nails of a particular group to the way in which they were made, the date, and the purpose—but that would be premature now. The first task is to describe what we found, and this is a beginning of that task. When it is more advanced, I hope to have better terminology.

"Cast" Nails

These are mentioned in the literature, but not explained nor described and poorly illustrated. We found five of these, which we characterized as

"suggestive of a clove". These were small (13/16 of an inch long), which also seems to be true of those few found elsewhere. Until I know more about the manufacture, I will keep the quotation marks around "cast".

Diagnostic Traits:

- 1) Shank has even taper on all four sides, to sharpe point, and is square in cross section at all places
- 2) At neck, shank slopes out to meet head evenly on all sides. Slope of neck almost equals slope of upper surfaces of head.
- 3) Head is a symmetrical four sided pyramid. The top rises to a small knob.
- 4) There are no sharp "cut" surfaces anywhere, on shank, neck, or head.

"Side Pinch" Headed Nails

These are like many other cut nails except in the way the heads are made. It is as though a vise or pliers had squeezed from the two sides and forced a small ridge or "pinch" of metal to extend from the head down to the shank in front and back.

Diagnostic Traits:

At the neck on front and back (the two broad surfaces as opposed to the narrow ones) there is a small flange or piece of metal attached to the head and to the neck. This piece is flattened on the sides as if squeezed.

"Block Headed Nail"

Only one of these was found, and it is quite possible that it was intended for use in a gun or some tool. The square, thick head suggests a metal socket to receive it. The shank has only a suggestion of squareness as if a square rod had been rounded and drawn out. (See drawing for appearance)

Diagnostic Traits:

- 1) Shank is nearly round and tapers evenly to sharp point. At neck it is nearly as thick as head.
- 2) Head is nearly cubical but may be slightly bulbous on top.

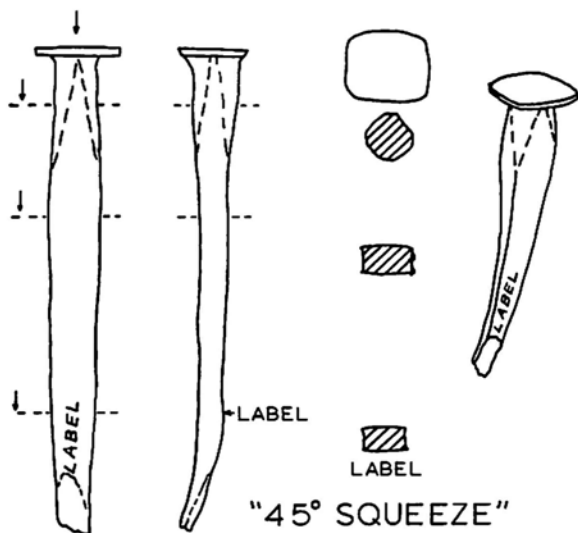
"45° Squeeze" Nails

These also have many of the aspects of other cut nails. Again, the difference seems to be at the neck. Here they are flattened or bevelled on the four corners. This bevel starts at the broadest part of the nail shank and becomes wider as it approaches the head, so that at the neck, the cross section is square, and turned 45° from the rectangle of the shank. It seems as though the metal had been pressed or squeezed just under the head, at an angle to the rest of the shank. This may prove to be a product of "faulty" heading. In other words, nails may have fallen into rectangular (or square) holes and then a heading hammer flattened the top. If they were just slightly out of line, they would tend to straighten themselves in the holes, but if they were exactly 45° off, the hammer might simply drive them into the hole that way. This is purely speculative - but the type is reasonably common. (See drawing).

Diagnostic Traits:

- 1) Shank is normal for cut nails, up to broadest place.
- 2) Corner bevels start there and become wider up to neck, at which point the four bevelled surfaces have replaced the other four surfaces of the shank.
- 3) Cross section is square at neck, and axis is 45° off rectangle of shank.
- 4) Head is flat, and fairly thin.

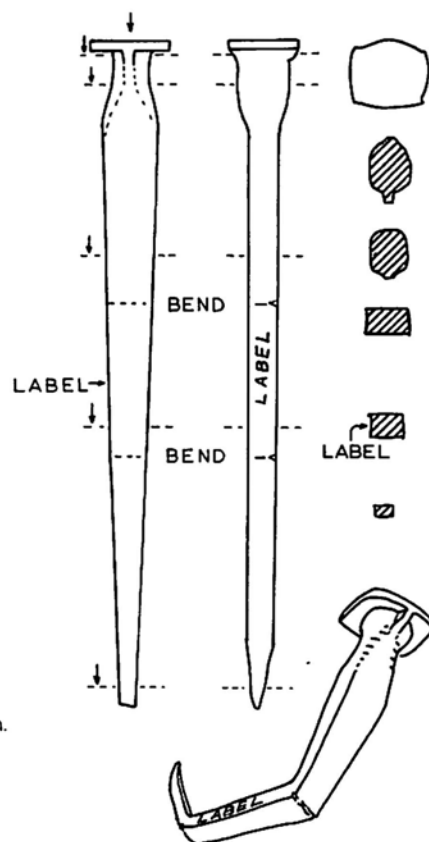
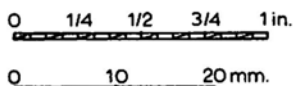
All of this is only a start, and modifications will be necessary. I would appreciate it if anyone with questions or suggestions for improvements would communicate with me, since it is important that this information should be presented in a way to make it useful.



"45° SQUEEZE"

Ft.K.1580

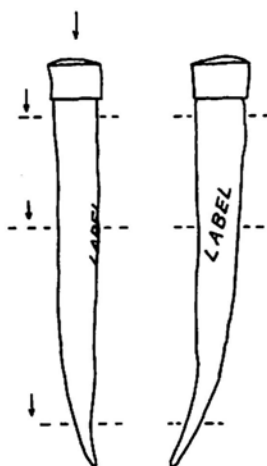
ACTUAL LENGTH
1+15/16 in. 50mm.
ca.6 or 7d. ? (INCOMPLETE)



"SIDE PINCHED"
(ALSO "BUTTRESSED")

Ft.K.1503

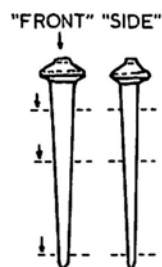
ACTUAL LENGTH
2+13/16 in. 68mm.
(2+3/4 in. BELOW HEAD)
9d. or 10d. COMMON



"BLOCK
HEAD"

Ft.K.1536

ACTUAL LENGTH
1+9/16 in. 41mm.
ca.4d.



"SIDE" "CAST"

Ft.K.134

ACTUAL LENGTH
13/16 in. 21mm.
(3/4 in. BELOW HEAD)
"BROOM NAIL" SIZE

TYPE SPECIMEN NAILS
FROM FORT KENTUCKY
SACKETS HARBOR, N.Y.

(OBLIQUE VIEWS NOT TO SCALE) MAR., 1968 EMM.L

THE RAISING OF THE MALLORYTOWN WRECK

Walter Zacharchuk
National Historic Sites Service
Department of Indian Affairs and Northern Development
Ottawa, Canada

In 1966, the National Historic Sites Service of the Canadian Department of Indian Affairs and Northern Development was informed by divers from the Kingston-Brockville area in Ontario of the existence of a wreck located in Patterson Bay (more commonly known as Brown's Bay), a small inlet on the north shore of the St. Lawrence River about 30 miles from the eastern end of Lake Ontario. The Service decided to examine this wreck and excavation was undertaken in the summer of 1966 by a crew of six regular divers plus local divers who assisted on week-ends.

During the initial excavation, the vessel was tentatively identified as a British gunboat. With the exception of a few unusual features such as a centreboard, the Mallorytown wreck corresponds closely with plans of late 18th and early 19th century British gunboats. A decision was made, therefore, to raise the wreck and, if subsequent investigations verified the tentative identification, to preserve the vessel for eventual exhibition.

The wreck lay approximately 300 feet from the shore in six feet of water and, except for the stern and centreboard box, was completely covered with sand. When it was excavated, the wooden hull was found to be $54 \frac{1}{2}$ feet long with a fifteen foot beam and a hold depth of $3 \frac{1}{2}$ feet. Three deck beams were recovered indicating that she was at least partially decked; no deck planking was found. The original workmanship of the boat is fine quality and the construction is light, the keel being 6" X 10" with ribs

approximately 3" x 3" in cross section. A large rectangular hole had been cut into the keelson and this is believed to be the mast step. This was formed by first drilling four holes into the keelson and then gouging out the intervening wood; the four auger holes are still visible at the bottom of the mast step hole. One of the deck beams recovered was notched to accept the mast and part of the mast clamp was found attached to this beam. The clamp and two iron pins fastened to the same beam are stamped with the broad arrow indicating that these were British military property. The available evidence suggests that the vessel was single masted.

Below the step, the keelson has been partially cut away to provide access to the bilge. This cut was necessary because the present keelson is a later addition to the vessel and is larger than the keel which, of course, is part of the original construction. The new keelson is a single piece of oak, 10" x 10" and 27 $\frac{1}{2}$ ' long. Fastened to the keelson by means of two knees hewn out of naturally curved wood was the centreboard case. The length of the case is eleven feet - about one-fifth the length of the vessel itself. The board is still in the case and is of the swivel type.

One of the most interesting architectural features of the construction of the vessel is the secondary planking of the hull. (see Plate 1) Except for the top three planks which are of carvel construction, the original "skin" is lap strake with the frames notched for the strakes. The fastenings, which are made of copper, became the souvenirs of many week-end pleasure divers over the years. However, at some time in her career the vessel was substantially altered. Extra ribs were added between each of the

original ribs and an entirely new "skin" covered the original hull planking. This new skin is also of lap strake construction and was held at bow and stern in new rabbets cut into the stem and stern posts. The planking of both skins is the same thickness (about 3/4") and the additional ribs are the same size as the original frames. The interior of the vessel is planked amidship and this too shows evidence of later construction. The secondary construction is characterized by the use of wrought iron nails, rather than copper fastenings.

Documentary research carried out by Judith Hudson indicates that the British gunboat fleet on the Great Lakes underwent substantial repairs and refurbishing during the period from approximately 1814 to about 1838. In the report of 1820 by F.E. Hawkes, the Admiralty was advised that "the expense of copper fastenings to ships employed on the Lakes is quite unnecessary, as the iron does not appear to be corroded in any degree as we have been accustomed to see it". Thus, the second skin is in keeping with the identification of the vessel as a Great Lakes gunboat. The removable centreboard, however, is a feature most unusual in gunboats; examination shows that the centreboard is a late addition probably associated with the replanking of the hull. It is possible that the vessel was sold for civilian use and that the replanking and the addition of a centreboard represent civilian modifications.

To contain and lift the wreck from the riverbed, it was felt that a very rigid structure would be required to prevent further collapse of the hulk during the operation. In accordance with the original design, the wooden cradle was 64' long and 29' wide and constructed to withstand any

stresses that might develop from uneven buoyancy or from wave action while being towed. There were eight plywood floatation chambers on each side of the wreck (Fig. 1). The advantage of this modification was that the belts did not have to be placed at regular intervals and therefore the boulders in the clay could be avoided. Only six belts instead of seventeen crossbeams would have to be used in the initial lift to support the vessel from beneath and thus only six tunnels would have to be dug. Furthermore the length of the cradle could be reduced by twelve feet which reduced its weight by approximately 30%.

In order to transport the disassembled cradle from Mallorytown Landing, the main beams and sub-assemblies were towed two and one-half miles downstream to Brown's Bay. The final assembly of the upside-down version of the cradle was made on the beach of Brown's Bay.

By this time the wreck and surrounding area had been prepared to receive the cradle. The sand which had been removed from within the wreck and from its perimeter was discharged seventy-five feet away from the working area. The assembled cradle was towed into position over the wreck (see Fig. 1); to sink the cradle down to the boat, six of the floatation chambers were placed on top of the cradle and used as ballast boxes. Careful ballasting, achieved by pumping sand into the boxes with a trash pump, provided a state of neutral buoyancy. Two divers positioned the cradle exactly over the wreck and additional sand pumped into the ballast boxes forced the cradle securely onto the riverbed. As an additional safeguard against movement of the cradle by wave-action, four forty-five gallon drums filled with sand, rock and cement, were lashed to the corners of the cradle.

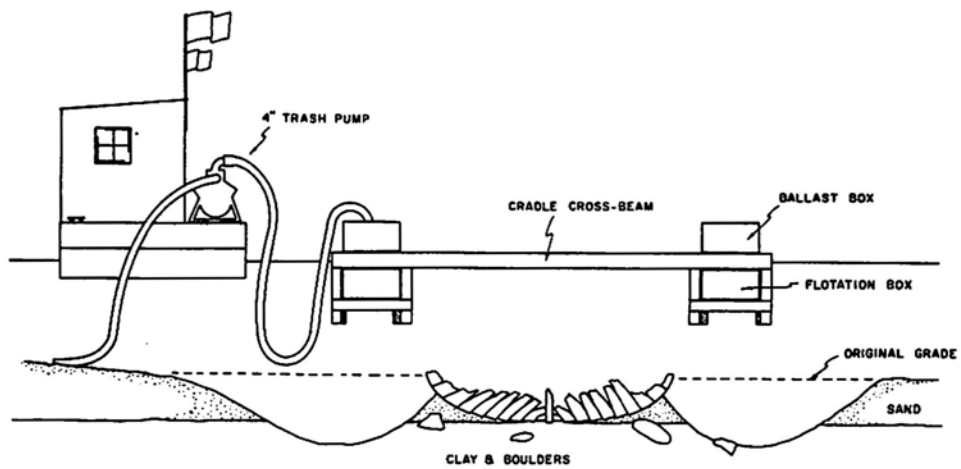


FIGURE 1

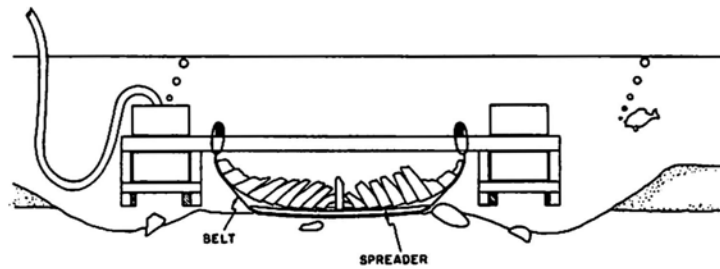


FIGURE 2

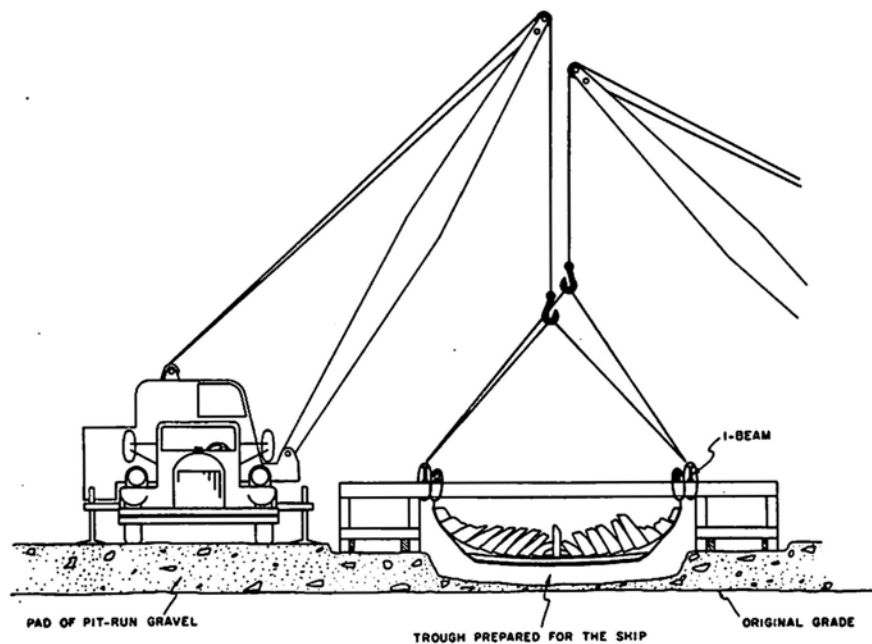


FIGURE 3

RAISING AND LANDING THE BROWN'S BAY SHIP

22-11-06

The next step was to tunnel under the hull of the wreck in order to place the belts and this was the most demanding and delicate aspect of the operation. In order to prevent the belts from forcing the sides of the wreck inward, wooden spreaders were nailed to the belts the width of the wreck's bottom (see Fig. 2).

Tunnels under the boat, large enough to pass belt and spreader, were excavated by using high pressure water jets and the trash pumps were employed to draw away the excavated clay (see Fig. 2).

Once the belts were secured under the hulk, they were hung with loops of steel cable from longitudinal, auxiliary timbers, resting on and spreading the load over several adjacent cross beams of the cradle. Wooden wedges driven under the steel loops were used to snug the belts up against the bottom of the ship.

The actual floatation seemed to be no problem since the buoyancy of the cradle without the ballast was sufficient to float the entire complex. However, for insurance, the ten remaining floatation chambers, five on each side of the cradle, were installed, (see Plate 2). It was necessary to wait for a calm day so that wave turbulence would not endanger the fragile hulk. On the appropriate day, June 2, 1967, the sand and concrete-filled drums were removed from the corners of the cradle and the pumps were used to remove small quantities of sand at a time from the ballast boxes. The entire lifting operation required less than six hours.

Since there were no facilities for bringing the vessel ashore at Brown's Bay, it was necessary to tow the vessel and its burden two and one-half miles upstream, back to Mallorytown Landing.

Here a trough, surrounded by a pad of coarse gravel, had been prepared on shore to receive the wreck. Although the boat was surprisingly light in the water, fourteen additional supporting belts were fastened around the hulk on four-foot centres. These belts would provide extra security during the lift and would reduce the deformation of the wreck under its own weight out of the water. Finally, all the fastenings were improved and double-checked.

Two cranes, one a fifty-ton and the other a twenty-five-ton, were needed to lift and control accurately the swing of the cradle, the surplus lift capacity being required by the angle at which the crane booms had to be placed. The gravel pad construction had been fashioned to support and spread the load of the cranes during the lift; two long I-beams reinforced the cradle longitudinally during the lift and anchored the lifting slings. The I-beams were laced to the cradle with wire cables, and the lifting slings were shackled to the eyes in the beams.

The initial part of the lift was made very slowly to see how the belts and cables would take the strain and to ensure that the water would drain away from the inside of the boat (see Plate 3). Midway through the lifting, the floatation chambers were removed since they added unnecessarily to the weight; even so the estimated weight of the cradle and boat after this operation was 22 tons. Once the cradle was successfully resting on the gravel pads with the wreck hanging within the trough (see Fig. 3), cleaning and recording in preparation for the preservation was begun.

RAISING OF THE MALLODRYTOWN WRECK

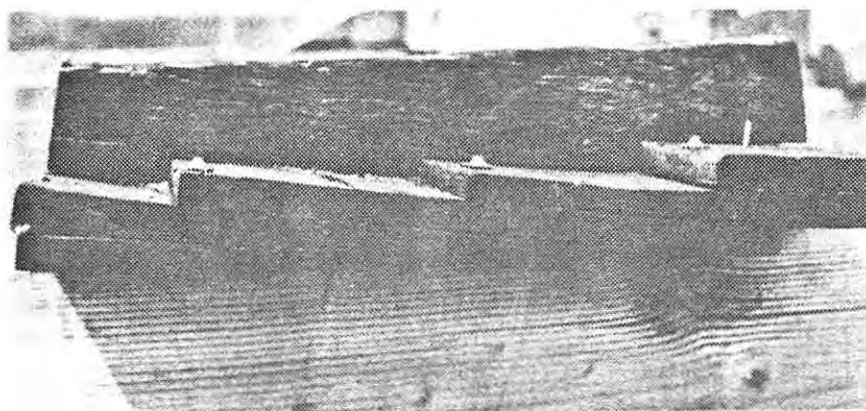


Plate 1



Plate 2

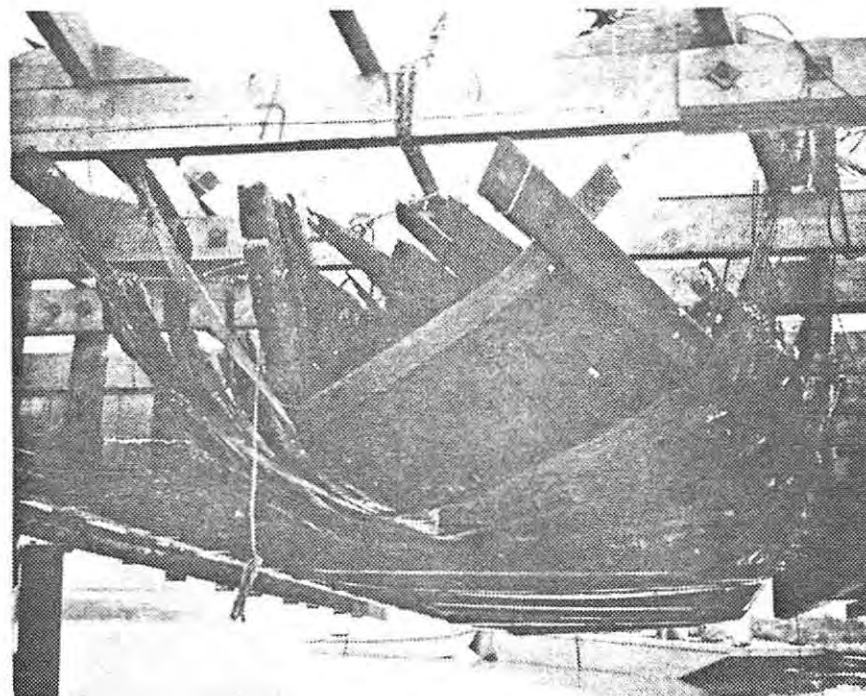


Plate 3

The cleaning and recording process required us to leave the hull exposed to the air for a period of several weeks and, to prevent the wood from drying, a sprinkling system was installed. A long plastic hose was perforated, and to each end was fastened a gasoline-driven water pump. This sprinkling system proved quite satisfactory for keeping the hull wet. Commercial vacuum cleaners were used to remove sand from within the hull and from between the inner and outer planking of the hull, while the algae was scrubbed from the planks with brushes. All of the sand from the vacuum cleaner was screened and washed on the deck of the work scow to avoid loss of small artifacts. Pitch from the underside of the hull was removed to permit better absorption of the preservative.

With the cleaning and recording finished, a preservative bath was assembled. To have enough preservative solution for total immersion of the boat, twenty tons of polyethelene glycol, (Carbowax) was needed and this was mixed with forty tons of water. An envelope of six layers of six-mil polyethelene sheeting was placed around the outside of the boat. This sheeting was supported on the outside by banks of sand. In effect, the vessel and the Carbowax solution were contained in a large tub constructed of sand banks lined with polyethelene sheeting. Eleven thousand gallons of preservative solution, weighing nearly sixty tons, completely immersed the wreck. A single sheet of polyethelene sheeting was then placed over the cradle to act as a vapour barrier to prevent excessive evaporation loss. Above this, a roof of plywood sheets covered with tar-paper was built. It was hoped that this roof would transmit heat from the sun and keep the solution at a higher than ambient temperature. During the winter, the

bath will be heated with four 5,000-watt heaters; electric mixers will be used to keep the solution circulating. It was calculated that for a total saturation of the hull, all of the ship's wooden components would have to absorb 7,500 lbs. of carbowax.

The solution temperature was between 75 degrees and 80 degrees for a period of three months. Solution samples were taken at intervals of two weeks and the absorption appears to be satisfactory. At the end of a three month period we found, by examining wood samples and solution density, that the hull has absorbed 6,000 lbs. of carbowax.

In the spring of 1968, the preservative solution will be drained and the wreck will be transported to a national historic park where it will be put on display as an interesting feature of Canada's past.

THE CAMDEN SITE, CAROLINE COUNTY, VIRGINIA

Howard A. MacCord, Sr.

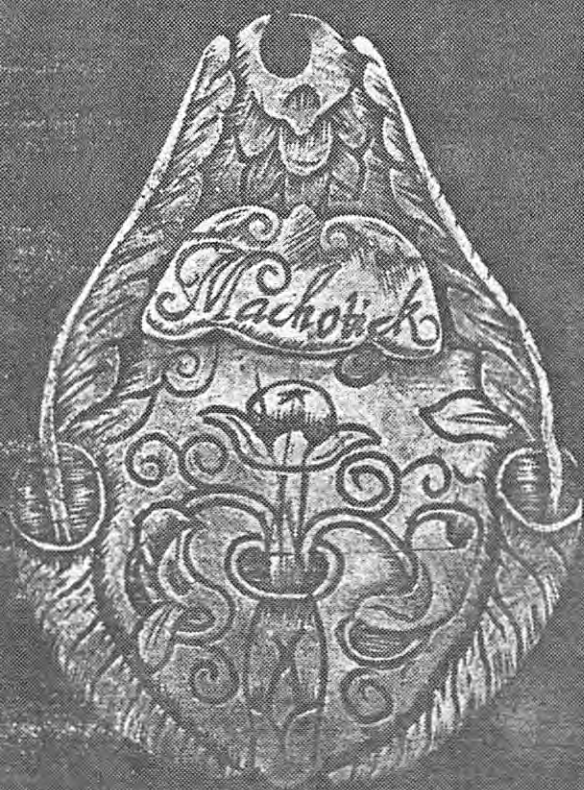
Virginia State Library
Richmond, Virginia

Every state along the Atlantic coast from Maine to Florida has one or more Indian remnant groups identifiable today. Presumably, these groups are the direct descendants of prehistoric groups of the area. While these groups generally are completely Europeanized, and their prehistoric cultures are studied by many archaeologists, there has been little if any research into the dynamics and stages of the transition from savagery to civilization experienced by these people. Considerable research will be needed to work out the processes involved and to identify the material cultures present at the various stages. The Indian-made pottery found at Williamsburg and elsewhere, which Mr. Noël Hume calls Colono-Indian Ware represents part of the cultural picture. Another aspect is evident in the cultural debris recovered at a site in Caroline County, some twenty-five miles east of Fredericksburg, Virginia.

The site is that of a single, isolated, frame dwelling, occupied by one Indian family during the final quarter of the 17th Century. The site covered about 1200 square feet, and all remains were screened from the topsoil. The evidence indicates a small cabin fronting toward the nearby Rappahannock River, with a mud and stick chimney, an earthen floor, and a central fire on the floor. Hand-forged nails indicate that the structure was made at least partly of boards, rather than logs. Other hardware found includes a hinge, bits of chain, parts of a door latch, and miscellaneous formless strips of iron. Domestic utensils include glass

and ceramics from Europe, although over 9000 fragments of Indian-made dishes were found. This ware seems to be a direct outgrowth from the late prehistoric pottery known as Potomac Creek ware. Some of the Indian bowls seem to be copies of European-made dishes. Stone tools were limited to hones and two flake scrapers. Metal files indicate the need to sharpen iron knives, axes, etc. One glass and two stone arrow-points were found, but four gunflints, one lead bullet, and two recognizable gun parts indicate that the occupant had a firearm. Personal adornment items found include locally-made shell beads and one made of glass. Smoking must have been a common pastime, judging from the more than 300 pipe fragments found. Most were of local, Indian manufacture, but some may have been made at Jamestown, and some were English-made kaolin pipes. The latter can be dated to the period from 1675 to 1690, centering around 1680. Two coins were found; a Spanish silver coin dated 1662, and an English farthing dated 1672. A silver medal bearing fine engraving and the inscription "Ye King of Matchotick" was found in the refuse. This medal may be one of those presented to the signers of a treaty in May, 1677, following Bacon's Rebellion.

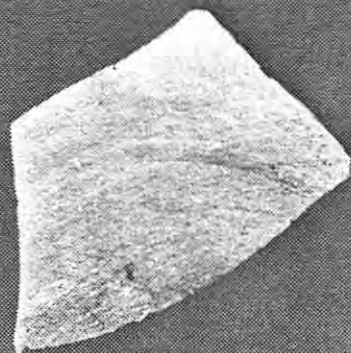
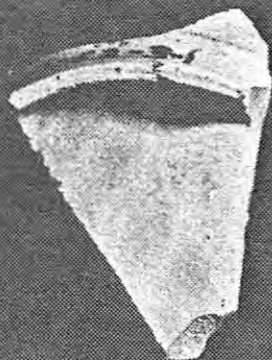
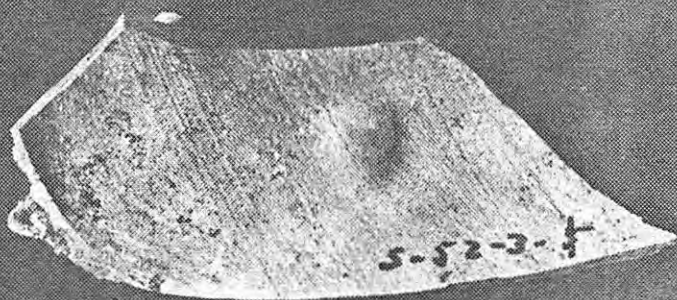
The occupant of the site was probably a tenant on a plantation, hired to supply the landlord with fresh meat, fish and oysters and to serve as interpreter, guide and scout. Colonial records show this to have been a common practice, but the excavations at Camden yield the first archaeological evidences of this custom.



- A. Mould, face. Terminal of English mid-eighteenth century stoneware and creamware types.

Mould impression.

- B. Mould, Back. Initials of Rudolph Christ, Salem potter (1772-1821). Mould probably made between 1774-1786.
- C. Pot, terminal. Unglazed stoneware, arrow illustrates scoring utilized during luting terminal.
- D. Pot, inside. Unglazed stoneware. Note tooling lines.
- E. Bowl, footring. Unglazed stoneware. Two-inch diameter foot indicates small bowl or saucer.
- F. Pot, lid. Unglazed stoneware. Small turning arcs indicate small diameter lid. Vessel probably milk pot form.



or Swinton type (Towner, 1957, p. 72, 78, Fig. 4) than does the sprigg mould. Donald Towner in describing (1963, p. 151, 153, Fig. 10) this terminal type with the acorns says that "These terminals are indicative of Leeds' manufacture of both the early and later periods, as they do not appear to have been used by any other factory."

The handle, underneath the flower of the terminal, though only a fragment (1/4") is represented, appears to be of the "double intertwined handle" (Towner, 1957, p. 69, 76, Fig. 8) type so extensively used by the Leeds Pottery. Whether this handle was of the reeded, roped, or plain variety is unknown. Towner (1957, p. 69) described the reeded handle as being associated with the forementioned Leeds or Swinton type terminal (Towner, 1957, p. 72, 78, Fig. 4).

Of the reeded double intertwined handles, there are four terminals on a vessel, each handle having two terminals on its origin or terminus. The terminal on the sherd excavated corresponds to the upper left terminal of the vessel from which it came because of its angle to the mouth of the vessel and its relation to the projected diameter (2") of the sherd.

Other evidence for this terminal being of the double handle type is the inner tooling lines (D in photo) and their oblique (54°) angle with the center line of the terminal. The tooling lines referred to are the lines cut inside the vessel through the action of shaping the interior and finishing its surface while the vessel is still plastic and therefore are parallel with the base and mouth of the vessel. These tooling lines form a slight spiral up to the mouth of the vessel, however, they are so close together (1/32") that they may be assumed to be parallel.

This sherd could not be from any object other than a coffee or milk-pot or some other vase-like form because the projected curvature of the sherd restricts the neck diameter as well as the terminal-to-mouth distance. The distance from the terminal to the mouth of the vessel (or any decoration) has to be over $1\frac{1}{4}$ " from the terminal as the sherd represents lack of any application, decoration or rim. Therefore, this sherd is from a vessel of a coffee or milk-pot form and was located as the upper left terminal.

As representative of the forementioned terminal and sherd, two other stoneware sherds also uncovered exhibit a questionable relationship with this form. One of these sherds (E in photo) is a foot and part of a base, which on the center has a diameter of $1\frac{7}{8}$ " and on the outside of the foot (where the base attaches) measures 2" in diameter. This diameter of the foot and the illustrated shape rather limits what association may be made as to vessel form: a cup plate, a shallow bowl, or a cup or perhaps a foot whose form is not illustrated in coffee or milk-pots in the Leeds' catalogue. This foot, if an association to a coffee or milk-pot is made, will have to be Christ's innovation, taking the foot from another vessel form.

The profile of the foot and base shows lack of quick rise from the foot up the wall of the vessel. Therefore, it probably is from a low bowl or a globular based pot. The interior of the base does not exhibit circular tooling lines and therefore may be indicative of the interior of a pot rather than of a bowl or dish form. Interior tooling of a bowl or dish would be effected easier than a pot because of the height of working distance and closeness of area.

The other stoneware sherd recovered (F in photo) illustrates a cover for a vessel. This is because there are arcing external tool lines. This sherd represents about one-fifth of the completed top. The curvature is slight and represents a low lid as found on a bowl, salt, dessert, tureen, or a coffee, milk or tea-pot. The curvature of the tooling lines and the sherd appear to be most likely the same as of the pots illustrated by Towner (1963, Plate 63, Fig. 13).

Evidence of these sherds being from a Salem produced vessel, aside from the mould, is the absence of glaze of any kind. Either this represented the completed vessel as the Elers-type red stoneware did—without glaze—or was intended to be further refired and this represents the first stage of firing. The latter could be evidenced by the intentional discard of this vessel in a waste dump yet to be found with this sherd merely a representative. The extreme hardness of the sherds is further proof of the intentional high firing of the ware with a stoneware as the product.

The appearance of the paste in the sherds is apparently what Christ meant when he said of the "fine pottery" that if "the first grain of sand... comes into the white clay, [it] will do a great damage" (A.C. 12 Sept. 1780). Perhaps this sandgrain and other foreign matter is what caused the surface of the sherds to be nicked and scratched. Also, there is an indication of foreign matter in the paste as lumps attest. This may be a reason for intentional rejection of this vessel after the bisque firing.

An interesting point concerning the process of sprigging is that on the sherd with the terminal, where a piece of the terminal is missing (C in photo, note arrow), a cross-hatching or scoring on the surface of the vessel is evident. This method of allowing a greater surface area and certainly a more stable one for the application of a sprigg as a terminal, took place while the vessel was still plastic. In sprigging the potter would apply liquid slip as an adhesive and then affix ('lute') the sprig to the vessel surface. The potter producing this vessel was either developing scoring as a parallel invention to the long-known technique in England or was taught by Ellis.

In The Leeds Pottery (1963), Plate 5a, illustrates a saltglaze sauceboat (ca. 1770) with reeded double intertwined handles and a close terminal type to the one under discussion. It is with this sauceboat that comparison can be made to plate 32-a which exhibits a teapot (ca. 1775) with identical terminals and handles, but of creamware. From these two forms it is possible that when the John Bartlam pottery was operating (?) and advertising for men in 1770, the terminal form Bartlam and his workers, then in Charleston, were knowledgeable of producing was saltgalze. The creamware use of this terminal was slowly being adopted in England. The fact is that while trying to pinpoint the ware produced by the yet-to-be-excavated Bartlam pottery one has to be cautious as this 1765-1775 period is the transition between saltglaze and creamware. The archaeological laboratories at Colonial Williamsburg have examples of overlapping molds of this period and urge strongly against positive dating.

With the preceding documentary evidence, one may presume the sherds under discussion are stoneware. A probable conclusion is that the sherds represent finished vessels when one understands that the saltglazing of stoneware and the firing of the vessel is a one-step process. The question of the unglazed stoneware, being either a waster or an accident during firing, is not important. What is important is that the sherds illustrate a finished product. Even if Christ intended to glaze the vessel for his "tortoise-shell" ware, he would have processed the entire vessel in one firing.

Realizing that the sherds are of a vessel that was, in its finished form, unglazed stoneware, one can see the background for this ware in the Elers tradition in England. The Elers and later redware potters produced a red-unglazed stoneware type which was in vogue in the 1740's. Later, after the 1740 to 1760 high production period of saltglazed stoneware by Wedgwood and other potters in England, it is not at all improbable that the red-unglazed stoneware of the red stoneware tradition was stylish in the Colonies. The 1770 period in America and the slow acceptance of red stoneware is understandable when one considers even twenty-five year lags in furniture styles from England to the Colonies.

More positive evidence for a date on the mould and the associated sherds can be found in John Marshall's Report to the Unitas Fratrum (5 May 1774) in which "The potter [Ellis] ...made a burning of Queensware, and one of stoneware, so that the process is now fairly understood here [Salem]". This, along with the negative evidence of stoneware in the Christ-Krause (Christ's successor) waster dump (1786-1789) at Bethabara,

proves Christ was not producing stoneware during the Bethabara period, but before he left Salem. However, Stanley South did uncover (1963-65), and yet to publish, a ceramic type which is creamware paste and most definitely tortoise-shell glaze. During this twelve-year (1774-1786) period in Salem, Christ, at one time, produced an unglazed stoneware and probably found it impractical to make. Either it was too time consuming or was not accepted by the public. Whatever the reason for his rejection of unglazed stoneware, it was not quick enough to hide the production of this ware from history through archaeology.

BIBLIOGRAPHY

- Aufseher Collegium Minutes, Moravian Archives, Winston-Salem, N.C.
- Blacker, J.F. The A.B.C. of English Salt-Glaze Stoneware.
Stanley Paul & Co., London: 1922.
- Clement, Arthur W. "Cermaics in the South: Antiques, Vol. 59,
pp. 136-138, 1951.
- Congregational Accounts, Moravian Archives, Winston-Salem, N.C.
- Fries, Adelaide L., ed., Records of the Moravians in North Carolina,
1752-1775, Vol. II, Raleigh: 1922.
- Honey, W.B. English Pottery and Porcelain. Faber and Faber, London: 1947.
- Price, Robin "Some Groups of English Redware of the Mid-Eighteenth
Century," The English Ceramics Circle, Transactions, Vol. IV,
Part 5, 1959.
- "Some Groups of English Redware of the Mid-Eighteenth
Century, Part II," The English Ceramic Circle, Transactions,
Vol. V, Part 3, 1962.
- Rackham, Bernard. Early Staffordshire Pottery. Faber and Faber, London: 1951.
- South, Stanley. "Excavating the 18th Century Moravian Town of Bethabara,
North Carolina," The Florida Anthropologist, Vol. XVIII, No.3,
Part 2, September, 1965.
- "The Ceramic Forms of the Potter Gottfried Aust of
Bethabara, North Carolina, 1755 to 1771," The Conference on
Historic Site Archaeology Papers, 1965-1966, Vol. 1, May, 1967.
- Towner, Donald C. English Cream-Coloured Earthenware, Pitman, New York: 1957.
- The Leeds Pottery. Cory, Adams and Mackay, London: 1963.

A NEW UNDERWATER EXCAVATING SYSTEM FOR THE ARCHAEOLOGIST^{*}

Carl J. Clausen

Florida State Board of Archives and History

The archaeologist, whether on land or underwater, must contend with excavating - physically uncovering that which he intends to study. Ashore, the traditional implements for this task have been the shovel and the trowel. Underwater, the majority of serious work in recent years (Franzen, 1964: 96; and Bass, 1966: 125-135) has been undertaken with the airlift or suceuse which, while it may not have a long tradition in archaeology, certainly has a history of respectable length.¹

Both the familiar airlift and its less well-known alternative, the injection dredge, popularized by divers mining gold in California rivers, have a proven record in underwater excavation. This is particularly true in those portions of the world where the deposition or shifting of sediments is relatively light. After thousands of years, shipwrecks or archaeological ruins in such areas may lie under only a few inches of sand or silt.

Unfortunately, a large percentage of underwater sites occur where the deposition of terrigenous sediments or the shifting of already present

^{*} A paper also delivered at the Third Conference on Underwater Archaeology in Miami, Florida, March, 1967.

¹ F. Dumas in his book Deep Water Archaeology, provides an exhaustive bibliography on the principle and use of the airlift pump in which a number of the articles published date from the period 1870-1910.

sediments is heavier. After even a hundred years, sites in these areas may lie below sand or silts ranging from a few feet to many yards in depth. In such situations the airlift and dredge are at a disadvantage. If, for example, a shipwreck lies under just four feet of sand, the airlift or dredge may have to move more than 100 cubic feet of overburden to clear a working area just two feet in diameter at the level of the wreck. The sides of holes excavated in deep sand or silt continually slip, seeking a stable slope. The airlift operator begins to feel like an "ant lion" building a trap, and it becomes difficult to establish or maintain horizontal control systems. Naturally, the expense of working a site rises rapidly with the depth of the overburden. If the area of a site is large, perhaps a scattered shipwreck covering several acres (Clausen, 1966: 80), the problems are, of course, multiplied.

Mendel Peterson, Curator of Armed Forces History at the Smithsonian, who has been making recoveries from a Spanish shipwreck off Bermuda, stated at the Third Conference on Underwater Archaeology, held recently in Miami, Florida, that literally thousands of cubic feet of calcarious sand and dead coral had to be removed from above that wreck before work could proceed.

George Bass of the University of Pennsylvania Museum revealed that, according to his calculations, fully 60 per cent of the below-water effort on the "Byzantine Wreck" of several years ago was directed towards the removal of overburden, largely by hand fanning. These statements clearly point up the problem which exists.

A little more than 36 months ago, what may be the answer to excavating in areas where heavy sediment presents a formidable obstacle to the orderly, efficient recovery of materials from a site was developed by a group of treasure hunters working on Colonial period shipwrecks off the Florida East Coast. Ironically, the first unit was built and installed on a vessel not with the intention of excavating, but to pump a continuous column of clear surface water down to the wreck site through dirty cooler layers of water trapped near the bottom to improve visibility for divers operating conventional injection dredges. What was accidentally created may well be the key to the ultimate excavating tool for the archaeologist underwater.

The first unit was an ugly, square, boxlike affair constructed of sheet metal, which captured the thrust of the vessel's single propeller and directed it against the bottom. In action, the powerful column of water forced the sediment into suspension and simply blew it away. In its original crude form, the blower was capable of opening an eight-by-ten-foot hole to bedrock through from four to six feet of sand, shell and loose coquina rock in approximately 10 minutes (Clausen, 1965: 3).

The versatility of the blower for excavating purposes is astounding. When working near its maximum speed in sterile sand overburden, one medium-sized unit can move an estimated 100 to 200 cubic feet of sediment per minute with a force requiring an observer to hold fast with two hands to some solid object to maintain position. The same unit, running at greatly reduced speed in levels with cultural remains, can gently remove the sand from around artifacts in an area 10 feet in diameter, exposing them as carefully as a diver fanning with his hand or small paddle.

As stated, the original models used the propulsion system of the boat, capturing and redirecting, or occasionally simply deflecting, the propeller's thrust. In many cases, with the digging unit fastened in place over the propeller or propellers, the vessel was immobilized. As there is an element of danger involved in even temporarily incapacitating a vessel, even a well-moored craft, near a shoal, reef, or off a weather shore where most wrecks have occurred, later versions were designed and built with their own propellers and power sources.

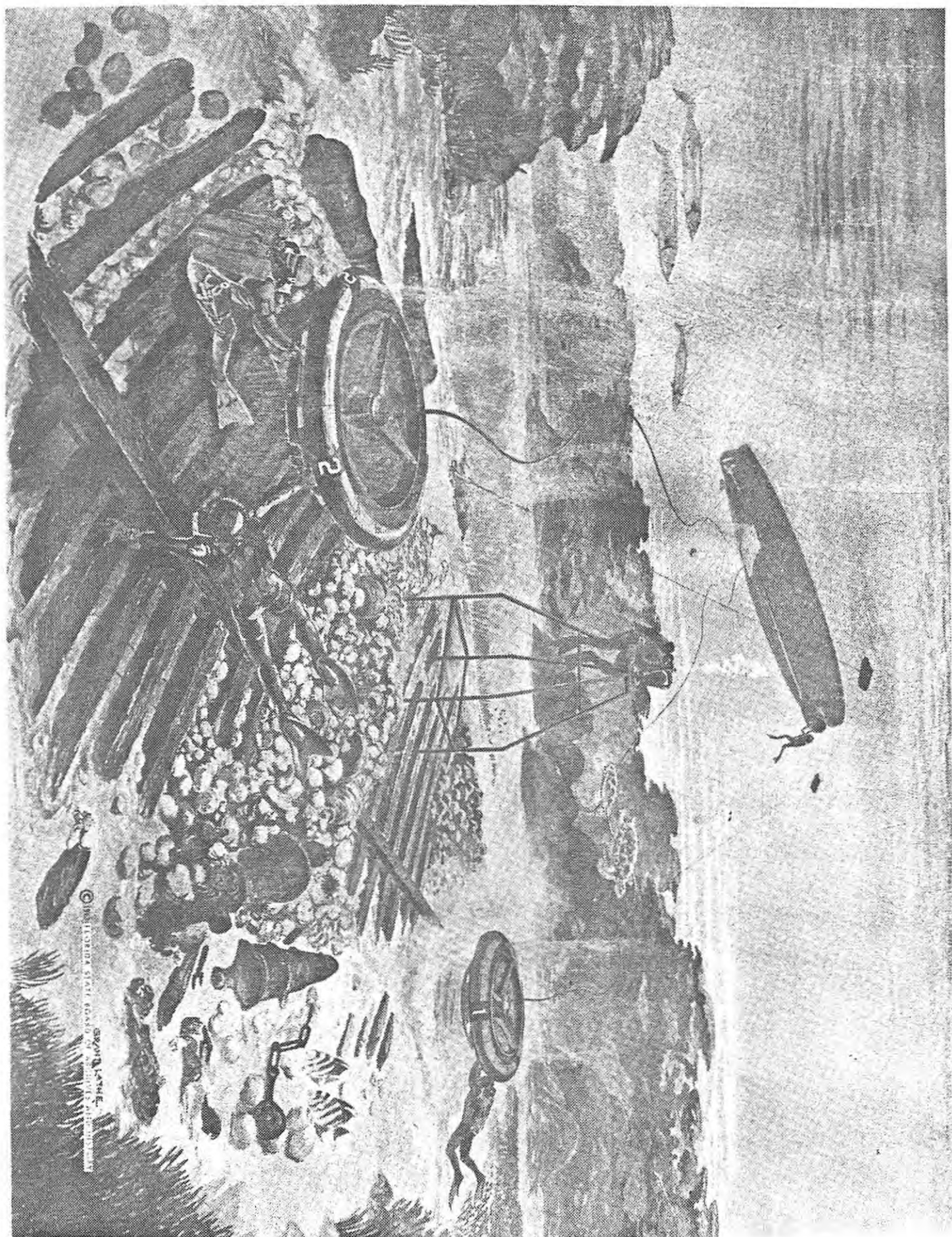
The most popular form of what might be called the "second generation blower" consists of a 20 or 30-inch boat's propeller centrally mounted in a metal cylinder. Power to the propeller shaft is supplied from a deck-mounted automotive-type engine through a modified automobile differential. In operation, the cylinder and propeller assembly, which rides below the surface, is securely fastened in a vertical position to the side or transom of the vessel.

Effective as either type of blower is, its efficiency drops rapidly as the concentrated thrust from the unit is dissipated in the surrounding water. At distances greater than 25 feet from the propeller, the blower is not effective. Depending on the design and placement of the unit on the vessel, the depth of water in which it can effectively be utilized is limited to approximately 30 feet.

Naturally, many wrecks lie deeper and there have been attempts to extend the effective operating depth. Chiefly the approach has been to lengthen the ducting, by attaching either rigid or flexible extensions. This has met with limited success. Extended sections of rigid ducting tended to multiply those lateral stresses generated by the rolling or

Plate 5

An artist's conception of the future excavation of a wreck in the Florida Keys. In the foreground an operator guides an excavating unit which is gently removing the sand from around the frames and keel of the wreck, while an observer watches. In the immediate background a cameraman photographs tagged artifacts and structural detail in an already exposed portion of the vessel. Further back a second excavating unit working at higher speed quickly removes sterile overburden which is redeposited down current away from the site.



- Plate 1. The original "blower", affectionately referred to as the "mailbox" by its developers. The unit was attached with steel pins to a cage assembly surrounding the propeller of the salvage vessel. The wash from the propeller, positioned inches away from the square opening on the side of the unit entered the assembly and was directed downwards. In 15 to 20 feet of water this unit was capable of opening an 8 by 10 foot hole to bedrock through from four to six feet of sand, shell and loose coquina rock in approximately 10 minutes. The tank and tube reduced the submerged weight of the unit, easing handling.
- Plate 2. This large, stern-mounted, scuttle-shaped assembly rotates downward to a position in front of the vessel's 52 inch wheel where it deflects the water toward the bottom.
- Plate 3. A "second generation" excavating unit on the deck of a vessel. The automobile differential, propeller and ducting are clearly shown. In use this unit is rigidly fixed to the side of the vessel in a vertical position. Power is drawn from an industrial engine mounted transversely below deck.
- Plate 4. Another "second generation" unit fabricated from aluminum and permanently mounted on the stern of a small vessel. Power in this case is supplied by a deck-mounted automotive engine. Shown here in its "travel attitude," the unit rotates counter clockwise through approximately 120° to a vertical working position.

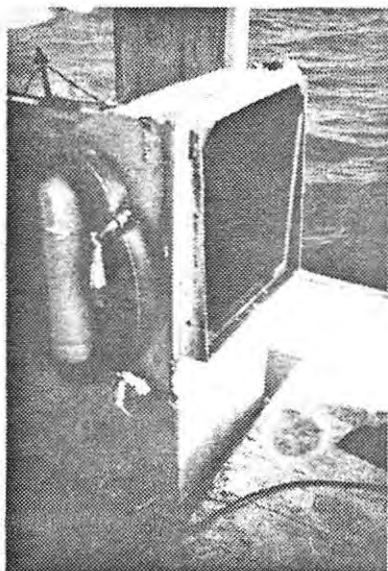


Plate 1

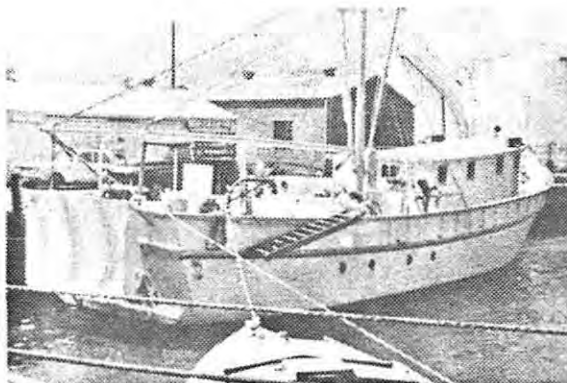


Plate 2

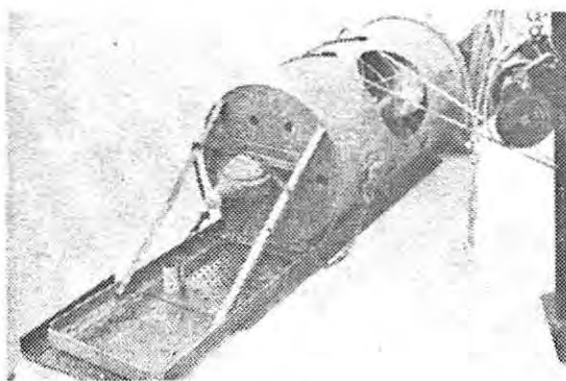


Plate 3

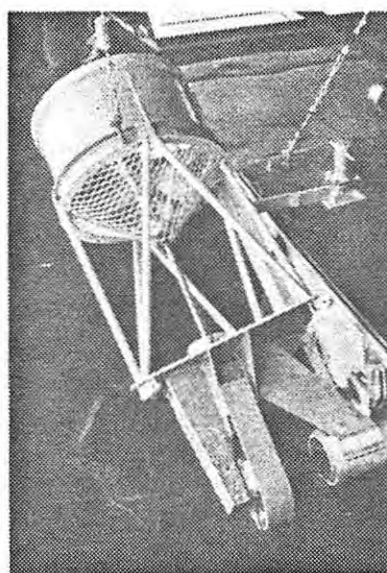


Plate 4

pitching motions of the vessel at the surface. Flexible ducting, for example a tube of heavy canvas, was tried but abandoned because torque transmitted to the water by the propeller caused the tube to twist and contort and become unmanageable.

In the opinion of this writer, the obvious step to alleviate the present short operating range is to free the unit from its direct attachment to a surface vessel. Once free, the "third generation" blower could be employed for excavating purposes at any depth now feasible for divers.

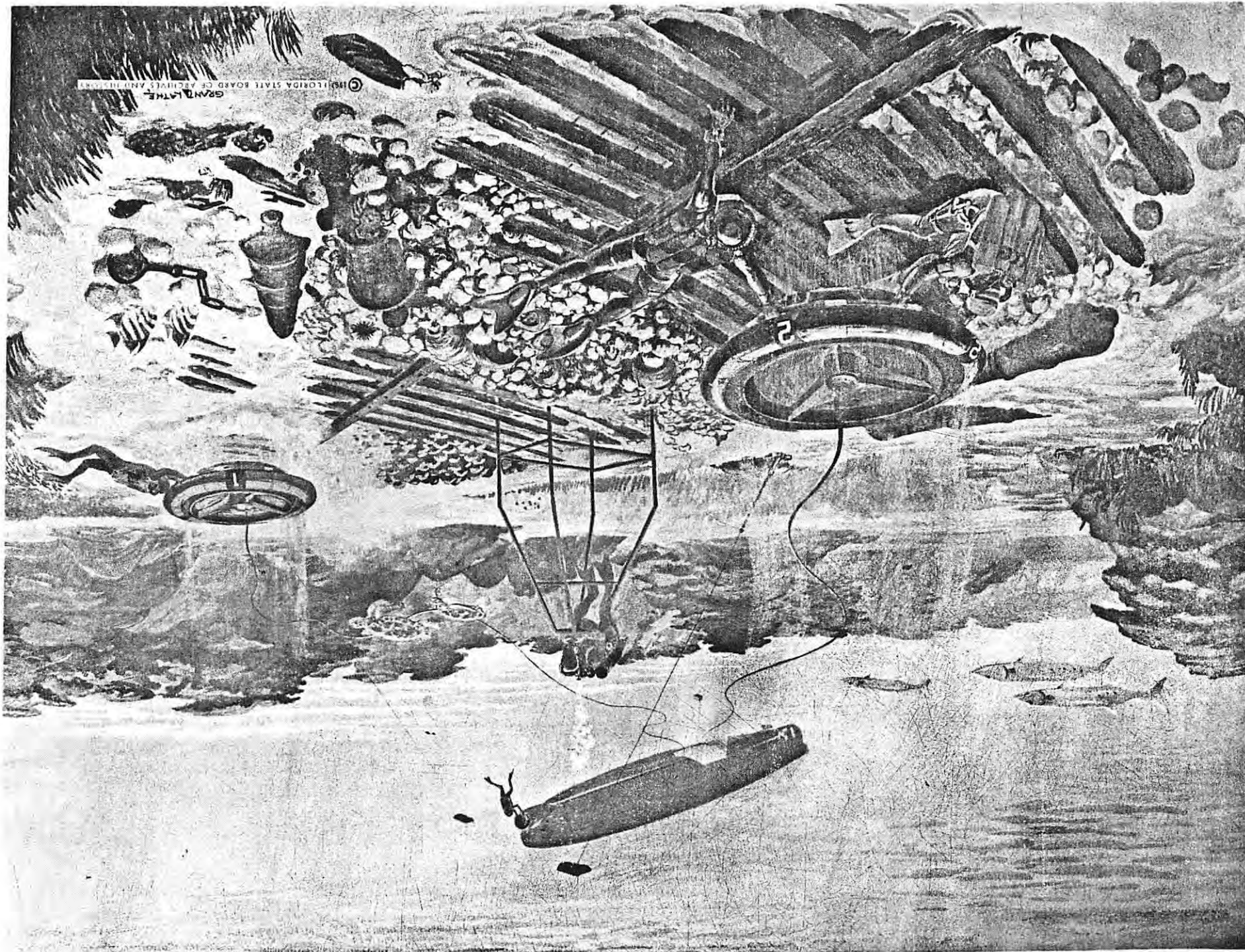
The scene in the accompanying artist's conception of the excavation of a Colonial Period wreck in the Florida Keys is no doubt several years in the future. In it we see one possible form the third generation blower might take.

The unit depicted is compact, perhaps seven to eight feet in diameter and a little more than two feet top to bottom. An umbilical connects the unit to the support vessel at the surface supplying power for a submersible turbine.

To counter the thrust developed by the unit's 60-inch propeller, 50 per cent of the water column is reversed and exits through the duct surrounding the center intake. The remaining approximately 40-inch in diameter column of water is sufficient to clear a working area of 70 to 80 square feet in up to 10 feet of sand. Torque is compensated for either by contra-rotating propellers or possibly by vanes set in the counter flow, and the weight of the unit is neutralized by the inflatable rubberized collar.

Plate 5

An artist's conception of the future excavation of a wreck in the Florida Keys. In the foreground an operator guides an excavating unit which is gently removing the sand from around the frames and keel of the wreck, while an observer watches. In the immediate background a cameraman photographs tagged artifacts and structural detail in an already exposed portion of the vessel. Further back a second excavating unit working at higher speed quickly removes sterile overburden which is redeposited down current away from the site.



Summary

This paper has reported on a new mechanism for excavating archaeological sites underwater. Within its present operating range, it is at least 10 to 20 times more efficient in removing overburden than the airlift or injection dredge. The blower's ability to cope with sites buried under deep sand and mud is a proven fact. In spite of the ability of the units to excavate enormous holes, by present standards, in unconsolidated sediments, it is a remarkably versatile tool, capable of gently exposing in situ even the most fragile of cultural remains. Unfortunately, at this stage of its development it is restricted to depths of 30 feet or less. However, development of units capable of remote operation at any depth where underwater archaeological sites may be reached by divers is possible. Capable of quickly clearing an entire wreck site or ruins in areas of either heavy or light sedimentation, the blower encourages a more economical approach to archaeological recovery underwater than has previously been feasible.

REFERENCES CITED

Bass, George F.

1966. Archaeology Under Water, New York.

Clausen, Carl J.

1965. "A 1715 Spanish Treasure Ship." Contributions of the Florida State Museum, Social Sciences, No. 12, Gainesville.

1966. "The Proton Magnetometer: Its Use in Plotting the Distribution of the Ferrous Components of a Shipwreck Site as an Aid to Archaeological Interpretation," The Florida Anthropologist, Vol. XIX, Nos. 2-3., Gainesville.

Dumas, Frederic

1962. Deep Water Archaeology, London.

Franzen, Anders

1964. "The Ghost Ship Vasa". In Diving into the Past, (J.D. Holmquist and A.H. Wheeler, eds.), Proceedings of the 1963 Conference on Underwater Archaeology, St. Paul.

A SPRIGG MOULD FOR "FLOWERS FOR THE FINE POTTERY"

Brad Rauschenberg
 Old Salem, Inc.
 Winston-Salem, North Carolina

In 1771 and again in 1773 visitors to Salem, North Carolina, taught English ceramic techniques to the local potters of the German ceramic tradition. Among these was 'sprigging' or the art of applying moulded impressions on ceramic vessels. It was the archaeological discovery of such a mould with the potter's initials that prompted the writing of this paper.

Not until 1963 when Stanley South began the excavation of the pre-Salem settlement of Bethabara was the full importance of the available documentary evidence understood. Archaeologically strengthening the Salem Moravian Archival material, South has begun to publish the ceramic analysis of the master potters of Bethabara. Having this knowledge, this archaeologist excavated exploratory trenches throughout the yard of the "First House" (1766) in Salem, with the purpose of revealing household artifacts as well as foundations for outbuildings. A 4' x 5' shallow midden or dump was revealed at the base of the 6" topsoil approximately twenty-five feet north of the First House foundation. This midden contained earthenware fragments: glazed and bisque. These fragments are of the Salem potters Gottfried Aust and Rudolph Christ, the former producing strictly a utilitarian ware ("unwashed") and the latter a decorative-specialized ware ("washed") consisting of "tortoise-shell"ware and "Queensware." It is of Rudolph Christ and what he produced, as a result of the visits of 1771 and 1773, that this paper is concerned.

While the origin of sprigging is still controversial, it can be said with certainty that in the 14th century "stamping" was being used, anticipating this application of moulded reliefs. Bernard Rackham illustrates in Medieval English Pottery vessels of the 14th century having reliefs which were formed both by "applying an intaglio stamp either directly to the surface or on a pad of clay previously laid on it" (Rackham, pp. 22-23). Again, in the 17th century, this stamping technique is evident on the Rhineland "Bellarmine" stoneware jugs. The English production of the "Bellarmine" jug is debated in ceramic circles; however, with the 1671 stoneware patent of John Dwight of Fulham and the 1688 production of stoneware by John and David Eler, the tradition quickly became most definitely English. In 1682 red stoneware mugs with reliefs of branches and plum-blossoms, which can be associated with the Elers, again illustrates "stamping."

Perhaps one of the most interesting uses of the stamping technique was on the Portobello vessels of 1739 depicting the capture of this fort in Panama. Here, impressions are assembled from dies of ships, Admiral Vernon and the fort. While these white saltglaze vessels exhibit stamping in a media which may be considered superior to the redware of the Elers and associated potters, it failed to carry the detail of the earlier unglazed redware. It was not until the Astbury period that stamping was to receive a revival from a more concrete technique—double-firing.

The Dwight-Elers tradition gave way to the Astbury-Whieldon tradition of the Staffordshire area in the appearance of a ware which had been subjected to two firings—an innovation of the single firing of the Dwight-Elers and the earlier slipware. After the vessel was formed and the reliefs applied, the vessel was fired, then refired after a lead glaze had been applied. This technique, utilized by Astbury in his contrastingly colored vessel and stamped reliefs, was adapted by Thomas Whieldon who may well be said to be the inventor of 'sprigging.' Whieldon's vine-stemmed teapots illustrate the first appearance of the application of pre-moulded reliefs. Not only was Whieldon the first to employ sprigging but the invention of creamware can also be attributed to him. Most commonly known and attributed to Whieldon is the 'tortoise-shell' ware of around 1757. This ware, a multicolored glaze flooded on the surface of his creamware forms, was quite a change from the clear glazes of pre-1750. It is this creamware that Whieldon's partner, Josiah Wedgwood, perfected in his own factory in 1761. Wedgwood later refined creamware and attained the Queen's patronage in 1765 that prompted the adaptation of the name "Queensware" to his creamware. Sprigged examples of Wedgwood's ware are found in 1763 and continued until the pre-Etrurian period and by the Staffordshire potters until 1780-85. Sprigged flowers and foliage terminals were not common to Wedgwood but can be definitely attributed to the Leeds Pottery of Yorkshire.

The Leeds Pottery located in Yorkshire had companion potteries as did Wedgwood and its Staffordshire district. It is because of this parallel development and plagiarism that absolute attribution cannot be made. However, from the published material at hand, this author believes the

excavated artifacts belong to the Yorkshire tradition or more specifically Leeds. This lure of the English ceramic tradition is further strengthened by the documentary evidence present in the Salem Moravian Archives, The Records of the Moravians, and files at Old Salem, Inc. It is to this documentary evidence we now turn before a possible attribution can be made of the archaeological evidence.

In 1771, Gottfried Aust, a Moravian potter from Herrnhut, Germany, began a Salem production of utilitarian ware typical of the German tradition. The background for this potter was the pre-Salem settlement of Bethabara (South, 1965, 1967), nine miles north of the 1766 town of Salem. It was from the experiences at Bethabara that Aust learned (1755-1771) of the mineral possibilities of the soil of the area.

From the Records of the Moravians in North Carolina (Fries, Vol. II, p. 763), the following entry of 1773 indicates the first contact with English ceramics of the Whieldon and Leeds' tradition:

It looks as though it would soon be necessary to make the English Queensware and Tortoise-shell, that is, a fine pottery resembling porcelain; the former is lighter than straw color, and the latter is mottled, like a tortoise shell. The matter began with a gentleman who was traveling through, and who would have liked to stay with us; we gave him lodging for some days, and some clothing, and in return he told Br. Aust how the work was done, and gave him the receipts, which he knew because he had been the superintendent of a factory which made such pottery. Recently, with the wagons from Charlestown, there came a young man who had worked in that same factory. He came without invitation or encouragement, and has asked for work here. He looks promising and we can use him, so we have given him permission to stay, though only on the same terms as other daylaborers, who can be dismissed at any time. A special kiln is being built, but only a small one, and we will see how it goes; for some time our pottery has been turning out a good product not very different from Queensware.

The identity of this "superintendent" is unknown, but the date of his visit is fixed because "It should be noted that two and a half years ago

Br. Aust learned something of the art of making this Queensware from a traveling potter..." (Ibid., p. 775). From this entry of 8 December, 1773 can then be deduced the approximate date of June 1771 as representative of the superintendent's visit. The "factory" mentioned in the entry is known from the 1783 publication: Address to the Workmen in the Pottery on the Subject of Entering into the Service of Foreign Manufactures by Josiah Wedgwood. In this publication is mentioned the failure of John Bartlam's "China Manufactory and Pottery" (Charlestown, South Carolina, established in 1770) and the only surviving person -- William Ellis of Hanley (Clement, p. 137).

It is this William Ellis of whom the 1773 entry describes:

There was discussion concerning a journeyman potter, by the name of Ellis, who arrived today from Charlestown, coming of his own accord. He had been in Pine Tree, and was on his way to Charlestown, when he met Br. Bagge, and asked if he might not come here, and was told he might do as he liked, but no promise of work could be given; that would have to be arranged with Br. Aust. He understands how to glaze and burn Queens Ware, so the Collegium approves Br. Aust's suggestion, which is, that a kiln, suitable for burning such ware, be built on the lot occupied by Br. Ludwig Meinung, which adjoins Aust's, where the man can work under supervision. He shall receive food and clothing, and a douceur for his work, and we will learn all we can from him about glazing, of which Br. Aust already has some knowledge. (Fries, op. cit., p. 775)

So it is revealed that in June 1771 a superintendent from the Bartlam factory in Charlestown visited Salem and gave Aust "receipts" [recipes] for the production of "the English Queensware and tortoise-shell" ware. Later, in 1773, a William Ellis from the same factory visited Salem to teach the "burning of such Queensware and tortoise-shell ware." In 1774 an entry from the Congregation Accounts mentions payment to "Wm. Ellis for his instructions of making Queensware...£10." This, together with the 1773 entry that mentions the construction of a "kiln suitable for burning such ware"

(Fries, op. cit., p. 775) shows that Ellis was producing the Queensware.

After five months of visiting Salem:

The potter from Pinetree /South Carolina—where Ellis visited evidently after the factory failure/made a burning of Queensware, and one of stoneware, so that process is now fairly understood here. As all the vessels had to be made by hand on the potter's bench, instead of with instruments on a potter's wheel, they were not delicate enough for porcelain, but they will serve as a side-line for our pottery, and can be further developed. The good man found our town too narrow for him, so for the present has bid us a friendly farewell. (Ibid., p. 817)

Thus ended—in May 1774—the teaching of the "fine pottery" by Ellis to Aust and his journeyman, Rudolph Christ.

Not until 1779 do we find any documentary evidence regarding the results of five months of instructions. On the 27th of January there is recorded (Auf. Col., p. 279) a statement by Aust in which the question of Rudolph Christ's character arises and Aust "testified that Christ has behaved honestly, however that he has carried away last week out of the pottery several forms which are used for flowers for the fine pottery." These "forms" could not be anything else but the moulds for terminals/spriggs which are found on the 1750-1820 period of the Whieldon-Wedgwood-Leeds creamware tradition of England.

In 1781 the Aufseher Collegium ruled that Christ should be paid by the piece. Here, as in the mention of the forms, one realizes that Christ is producing the fine pottery, and perhaps the slip-decorated ware, while Aust is producing the utilitarian ware.

In 1780, Christ (age 30) requests to be allowed his own pottery in Salem because "the fine pottery cannot be manufactured together with the rough pottery [of Aust's], because the finest grain of sand that comes into the white clay will do a great damage, and as concerns the drying,

just the opposite has to be done with the one than with the other...he [Christ] could also take up the manufacturing of white, black, and salt-pottery." (Auf. Col. 12 Sept. 1780).

Christ's manufacture of pottery at Salem is further defined in 1782 when he:

asked again urgently that he would like to start working on the Queens and Salt-pottery...[and that he wants a contract] between him and Br. Aust that specifies what each of them has to manufacture, so that neither of them makes the wares of the other....[Aust's] idea was that...[he] could make his pottery...excluding the pipeheads... only from non-washed clay, and that Br. Christ should make no other kind of pottery than that from washed clay, which may be glazed with all sorts of colors...Christ must not manufacture anything from the unwashed clay, except the cases or the round pots [saggers] in which he keeps his pottery when he burns it. Br. Aust reminded also that several of the plate and dish forms, which are necessary for the fine pottery, are still in his shop, with which Christ has worked in the payment of the pottery.. . (Auf. Col. 1 Aug. 1782).

From these entries it is clear that Christ had chosen to produce the "fine pottery" which would include "Queensware, tortoise-shell" ware and "white, black [Black "asaltres of Wedgwood?]" and salt-pottery." Complete evidence for Salem production of these wares must wait for the archaeological investigation of the Salem pottery.

In 1786 Christ moved to Bethabara where he potted until he became the Master Potter of Salem upon Aust's death in 1788. In January of 1789, Christ began the Salem Pottery and operated it so effectively until his resignation in 1821 that there are very few entries found in the records. It may be noted that the lack of entries indicates that the person or business merely did not encounter misfortune, Church business or inefficiency regarding the business.

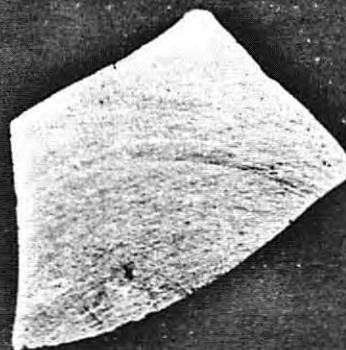
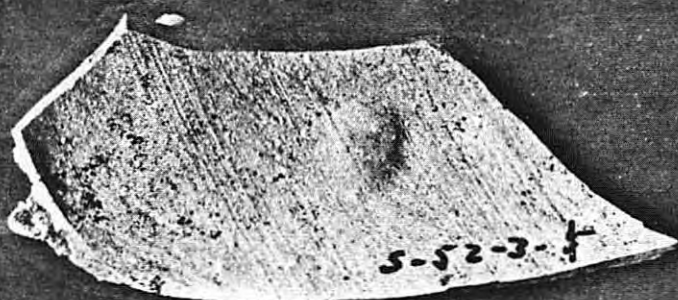
With this brief account of documentary evidence of Rudolph Christ and what he produced while a potter, we can now begin an analysis of the excavated mould and its associated sherds. While the following evidence is affirmative from the artifact description, attribution to the English counterpart is strictly speculative because of the difficulty in establishing provenances for mid-eighteenth century wares and the unknown factory origin of John Bartlam's workmen. The sprigg mould (A in photo) is 1 - 15/16" long, 1 - 3/8" wide, and 9/16" thick. It is of a fired, unglazed, red earthenware with rounded corners, slightly flaring base and concave face. The floral intaglio pattern (1 - 3/8" x 7/8") and, on the reverse (B in photo) the initials "R.C." (Rudolph Christ) were executed before the mould was fired and still plastic. The floral pattern is very comparable with the sprigg decorations of the mid-eighteenth century as are found on the stoneware and creamware of the 1765-1775 period of Leeds. While not clearly defined, the intaglio trifoliate pattern with a quatre-foolate flower or leaf at its terminus, is similar to the terminals in the Leeds Pottery design book (p. 153) of Donald Towner: The Leeds Pottery. This 1963 publication contains designs taken from early editions of the Leeds Pottery catalog.

In the midden, aside from the sprigg mould, three sherds (C,E,F, in photo) were excavated, each exhibiting a possible connection with the mould or its English tradition. Each of these sherds is of stoneware quality, unglazed, light gray, and one-sixteenth of an inch in thickness. One sherd (C in photo) exhibits a terminal with handle fragment. This terminal differs from the sprigg mould in that it presents a definite flower, three small leaves and two acorns. This type more closely approaches the Leeds

- A. Mould, face. Terminal of English mid-eighteenth century stoneware and creamware types.

Mould impression.

- B. Mould, Back. Initials of Rudolph Christ, Salem potter (1772-1821). Mould probably made between 1774-1786.
- C. Pot, terminal. Unglazed stoneware, arrow illustrates scoring utilized during luting terminal.
- D. Pot, inside. Unglazed stoneware. Note tooling lines.
- E. Bowl, footring. Unglazed stoneware. Two-inch diameter foot indicates small bowl or saucer.
- F. Pot, lid. Unglazed stoneware. Small turning arcs indicate small diameter lid. Vessel probably milk pot form.



or Swinton type (Towner, 1957, p. 72, 78, Fig. 4) than does the sprigg mould. Donald Towner in describing (1963, p. 151, 153, Fig. 10) this terminal type with the acorns says that "These terminals are indicative of Leeds' manufacture of both the early and later periods, as they do not appear to have been used by any other factory."

The handle, underneath the flower of the terminal, though only a fragment ($1/4$ ") is represented, appears to be of the "double intertwined handle" (Towner, 1957, p. 69, 76, Fig. 8) type so extensively used by the Leeds Pottery. Whether this handle was of the reeded, roped, or plain variety is unknown. Towner (1957, p. 69) described the reeded handle as being associated with the forementioned Leeds or Swinton type terminal (Towner, 1957, p. 72, 78, Fig. 4).

Of the reeded double intertwined handles, there are four terminals on a vessel, each handle having two terminals on its origin or terminus. The terminal on the sherd excavated corresponds to the upper left terminal of the vessel from which it came because of its angle to the mouth of the vessel and its relation to the projected diameter ($2''$) of the sherd.

Other evidence for this terminal being of the double handle type is the inner tooling lines (D in photo) and their oblique (54°) angle with the center line of the terminal. The tooling lines referred to are the lines cut inside the vessel through the action of shaping the interior and finishing its surface while the vessel is still plastic and therefore are parallel with the base and mouth of the vessel. These tooling lines form a slight spiral up to the mouth of the vessel, however, they are so close together ($1/32''$) that they may be assumed to be parallel.

This sherd could not be from any object other than a coffee or milk-pot or some other vase-like form because the projected curvature of the sherd restricts the neck diameter as well as the terminal-to-mouth distance. The distance from the terminal to the mouth of the vessel (or any decoration) has to be over $1\frac{1}{4}$ " from the terminal as the sherd represents lack of any application, decoration or rim. Therefore, this sherd is from a vessel of a coffee or milk-pot form and was located as the upper left terminal.

As representative of the forementioned terminal and sherd, two other stoneware sherds also uncovered exhibit a questionable relationship with this form. One of these sherds (E in photo) is a foot and part of a base, which on the center has a diameter of $1\frac{7}{8}$ " and on the outside of the foot (where the base attaches) measures 2" in diameter. This diameter of the foot and the illustrated shape rather limits what association may be made as to vessel form: a cup plate, a shallow bowl, or a cup or perhaps a foot whose form is not illustrated in coffee or milk-pots in the Leeds' catalogue. This foot, if an association to a coffee or milk-pot is made, will have to be Christ's innovation, taking the foot from another vessel form.

The profile of the foot and base shows lack of quick rise from the foot up the wall of the vessel. Therefore, it probably is from a low bowl or a globular based pot. The interior of the base does not exhibit circular tooling lines and therefore may be indicative of the interior of a pot rather than of a bowl or dish form. Interior tooling of a bowl or dish would be effected easier than a pot because of the height of working distance and closeness of area.

The other stoneware sherd recovered (F in photo) illustrates a cover for a vessel. This is because there are arcing external tool lines. This sherd represents about one-fifth of the completed top. The curvature is slight and represents a low lid as found on a bowl, salt, dessert, tureen, or a coffee, milk or tea-pot. The curvature of the tooling lines and the sherd appear to be most likely the same as of the pots illustrated by Towner (1963, Plate 63, Fig. 13).

Evidence of these sherds being from a Salem produced vessel, aside from the mould, is the absence of glaze of any kind. Either this represented the completed vessel as the Elers-type red stoneware did—without glaze—or was intended to be further refired and this represents the first stage of firing. The latter could be evidenced by the intentional discard of this vessel in a waste dump yet to be found with this sherd merely a representative. The extreme hardness of the sherds is further proof of the intentional high firing of the ware with a stoneware as the product.

The appearance of the paste in the sherds is apparently what Christ meant when he said of the "fine pottery" that if "the first grain of sand... comes into the white clay, [it] will do a great damage" (A.C. 12 Sept. 1780). Perhaps this sandgrain and other foreign matter is what caused the surface of the sherds to be nicked and scratched. Also, there is an indication of foreign matter in the paste as lumps attest. This may be a reason for intentional rejection of this vessel after the bisque firing.

An interesting point concerning the process of sprigging is that on the sherd with the terminal, where a piece of the terminal is missing (C in photo, note arrow), a cross-hatching or scoring on the surface of the vessel is evident. This method of allowing a greater surface area and certainly a more stable one for the application of a sprigg as a terminal, took place while the vessel was still plastic. In sprigging the potter would apply liquid slip as an adhesive and then affix ('lute') the sprig to the vessel surface. The potter producing this vessel was either developing scoring as a parallel invention to the long-known technique in England or was taught by Ellis.

In The Leeds Pottery (1963), Plate 5a, illustrates a saltglaze sauceboat (ca. 1770) with reeded double intertwined handles and a close terminal type to the one under discussion. It is with this sauceboat that comparison can be made to plate 32-a which exhibits a teapot (ca. 1775) with identical terminals and handles, but of creamware. From these two forms it is possible that when the John Bartlam pottery was operating (?) and advertising for men in 1770, the terminal form Bartlam and his workers, then in Charleston, were knowledgeable of producing was saltgalze. The creamware use of this terminal was slowly being adopted in England. The fact is that while trying to pinpoint the ware produced by the yet-to-be-excavated Bartlam pottery one has to be cautious as this 1765-1775 period is the transition between saltglaze and creamware. The archaeological laboratories at Colonial Williamsburg have examples of overlapping molds of this period and urge strongly against positive dating.

With the preceding documentary evidence, one may presume the sherds under discussion are stoneware. A probable conclusion is that the sherds represent finished vessels when one understands that the saltglazing of stoneware and the firing of the vessel is a one-step process. The question of the unglazed stoneware, being either a waster or an accident during firing, is not important. What is important is that the sherds illustrate a finished product. Even if Christ intended to glaze the vessel for his "tortoise-shell" ware, he would have processed the entire vessel in one firing.

Realizing that the sherds are of a vessel that was, in its finished form, unglazed stoneware, one can see the background for this ware in the Elers tradition in England. The Elers and later redware potters produced a red-unglazed stoneware type which was in vogue in the 1740's. Later, after the 1740 to 1760 high production period of saltglazed stoneware by Wedgwood and other potters in England, it is not at all improbable that the red-unglazed stoneware of the red stoneware tradition was stylish in the Colonies. The 1770 period in America and the slow acceptance of red stoneware is understandable when one considers even twenty-five year lags in furniture styles from England to the Colonies.

More positive evidence for a date on the mould and the associated sherds can be found in John Marshall's Report to the Unitas Fratrum (5 May 1774) in which "The potter [Ellis] ...made a burning of Queensware, and one of stoneware, so that the process is now fairly understood here [Salem]". This, along with the negative evidence of stoneware in the Christ-Krause (Christ's successor) waster dump (1786-1789) at Bethabara,

proves Christ was not producing stoneware during the Bethabara period, but before he left Salem. However, Stanley South did uncover (1963-65), and yet to publish, a ceramic type which is creamware paste and most definitely tortoise-shell glaze. During this twelve-year (1774-1786) period in Salem, Christ, at one time, produced an unglazed stoneware and probably found it impractical to make. Either it was too time consuming or was not accepted by the public. Whatever the reason for his rejection of unglazed stoneware, it was not quick enough to hide the production of this ware from history through archaeology.

BIBLIOGRAPHY

- Aufseher Collegium Minutes, Moravian Archives, Winston-Salem, N.C.
- Blacker, J.F. The A.B.C. of English Salt-Glaze Stoneware.
Stanley Paul & Co., London: 1922.
- Clement, Arthur W. "Cermaics in the South: Antiques, Vol. 59,
pp. 136-138, 1951.
- Congregational Accounts, Moravian Archives, Winston-Salem, N.C.
- Fries, Adelaide L., ed., Records of the Moravians in North Carolina,
1752-1775, Vol. II, Raleigh: 1922.
- Honey, W.B. English Pottery and Porcelain. Faber and Faber, London: 1947.
- Price, Robin "Some Groups of English Redware of the Mid-Eighteenth
Century," The English Ceramics Circle, Transactions, Vol. IV,
Part 5, 1959.
- "Some Groups of English Redware of the Mid-Eighteenth
Century, Part II," The English Ceramic Circle, Transactions,
Vol. V, Part 3, 1962.
- Rackham, Bernard. Early Staffordshire Pottery. Faber and Faber, London: 1951.
- South, Stanley. "Excavating the 18th Century Moravian Town of Bethabara,
North Carolina," The Florida Anthropologist, Vol. XVIII, No.3,
Part 2, September, 1965.
- "The Ceramic Forms of the Potter Gottfried Aust of
Bethabara, North Carolina, 1755 to 1771," The Conference on
Historic Site Archaeology Papers, 1965-1966, Vol. 1, May, 1967.
- Towner, Donald C. English Cream-Coloured Earthenware, Pitman, New York: 1957.
- The Leeds Pottery. Cory, Adams and Mackay, London: 1963.